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SIR FRANCIS SEYMOUR HADEN

[1818-1910]

[From Fernelius' Universa Medicina, Geneva, 1679.]

ANNALS OF MEDICAL HISTORY

New Series, Volume VI November, 1934 Number 6

SIR FRANCIS SEYMOUR HADEN

By ESTELLE C. BICK

NEW YORK CITY

ON September 16th in the year 1818 at 62 Sloane Street, London, Francis Seymour Haden was born to Charles and Emma Haden. When, in later life, he gained the reputation of being an excellent surgeon as well as one of the greatest contributors to the world of art during the nineteenth century, he justified the fact that he was born well endowed, physically, socially and financially. Charles Thomas Haden, his father, was born in Derby, December 2, 1786 and was himself a surgeon. Highly bred and of good family he gave to his son the social prestige which in that day was so essential to success in English professional life. Except for the fact that he was educated at Rugby, little is known of his scholastic background. In 1810 he was elected one of the surgeons to the Derby infirmary. In 1814, he came to London where he became an extremely active member of his profession. He was a skillful writer and did much toward improving the medicine of his time. In 1823, he published a paper on "Practical Observations on the Management and Diseases of Children." Having worked closely with Laënnec, he availed himself of the opportunity of introducing into England the stethoscope, which had only recently been invented. His standing in the scientific world was high and it is interesting to note that among his intimates was Darwin, the naturalist, father of the celebrated Charles Darwin. His death was untimely and at the early age of thirty-eight he bequeathed his good name and standing to his son Francis.

Although Seymour Haden was primarily a surgeon, it may have been the early influence of his parents' musical interests that brought about his artistic inclination. His mother, Emma, the daughter of a well-known vocalist, was an excellent musician, as was his father, whose reputation was that of a skilled amateur. A product of a cultural background, it is easy to understand his untiring efforts as one of the culturists of his time.

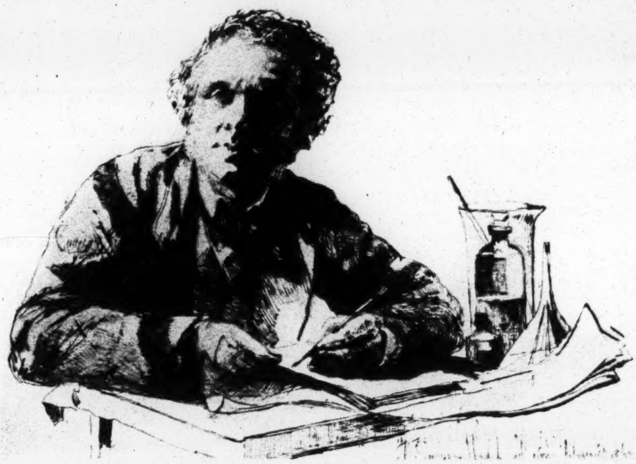

Fig. 1. Portrait of Seymour Haden. Courtesy of The Metropolitan Museum of Art.

Haden received his general education at the Derby school. He continued his studies at Christ's Hospital and during 1837 attended the University College of London. In 1838, he finished his professional education at the Sorbonne in Paris. In 1839, he was attached as Prosecteur to a hospital in Grenoble, later becoming a lecturer on surgical anatomy at the military hospital there. He then returned to Paris for his final examination in medicine and surgery and there took his degree in 1840. In 1842, he became a member and in 1857 a fellow of the Royal College of Surgeons.

It was during his studies at the Sorbonne that he attended classes of the Government School of Art which were held in the same building as the School of Medicine. He pursued these extra-curricular courses for the avowed purpose of training his power of observation and improving his manual dexterity. It was early in life that he recognized the value of drawing as an aid to delicacy in surgery. Years later, in a report on the Educational and Instrumental Appliances of Modern Surgery in the International Exhibition of 1862, he expounded his own reasons for etching and wrote as follows:

> It is surprising that while so much is being done to prepare the student of medicine and surgery for the difficulties of his career, nothing is done to educate his eye and hand. Such an item in his education is essential and nothing in my judgment would more directly and pleasantly conduce to it than the practice of drawing and modelling from nature. How much sooner would the eye, accustomed to observe and estimate closely differences of colour, aspect, weight and symmetry learn to gauge their aberrations as signs which make up the "facies" of disease, how much better the hand trained to portray them accurately be able to direct with precision and safety the course of the knife? . . . It has perhaps not even yet occurred to those of

my distinguished confreres, who delight to spend their short holidays in the practices of art, how serious a matter of skilled training lies at the bottom of their practice.

It was after his arduous studies in Paris, in 1843, with his intimate friends, Comte Belluno and the painter Duval le Camus, that he journeyed to Italy, where he was inspired to his first efforts in etching. While in Rome through the introduction of the Marquis de Belluno, Haden was granted several interviews with Pope Gregory XVI. As the story is told, it was during two or three of them he took the liberty of sketching, on his shirt cuff, a portrait of His Holiness, who graciously appeared to be totally ignorant of the assiduous efforts of the artist. It was not until the portrait was completed that he remarked "he now understood why Mr. Haden had attended at three audiences without a change of linen."

Impressions from these early plates, done during his sojourn in Italy, are unique but are more or less inconsequential, for his real work did not begin until approximately 1858 or 1859. Recently there have appeared at various sales etchings done by Haden prior to 1858 but it was not until after that date that he seriously considered the etching needle as the medium by which he found more or less complete artistic expression.

In 1847, he entered private practice as a surgeon at 62 Sloane Street, London. On October 16th of the same year he married Deborah Delano Whistler, the daughter of one Major Whistler, an American army officer. She was half sister of the famous artist James McNeill Whistler who was the issue of her father's second marriage. Haden's wife, "Dasha," as he affectionately called her, was an intelligent and remarkable woman. She had dire need of both of those qualities. Deeply attached to the great Whistler who for years was a guest in the Haden household, she spent much of her energy reconciling Haden and her brother. Years younger than Haden and filled with an all-consuming enthusiasm for his work, Whistler, already an accomplished artist, stirred within Haden the desire to again take up the etching needle. At this time, Haden had already gained eminence as a surgeon and feeling the necessity for moments of mental relaxation would occasionally steal away from a busy practice to enjoy the quiet of the English countryside. He was often accompanied on these excursions by Whistler. It is interesting to compare the results of both artists and see their extremely different treatment

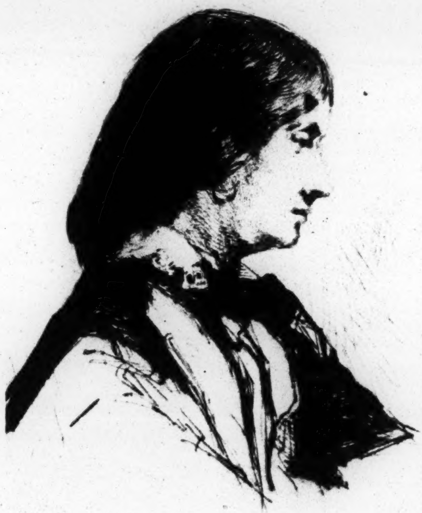

FIG. 2. "DASHA." COURTESY OF THE METROPOLITAN MUSEUM OF ART.

of the same subject, for neither of them traveled very far without having etching needles and prepared copper plates close at hand. Their friendship, however, ended in a violent quarrel and was definitely ruptured in 1867.

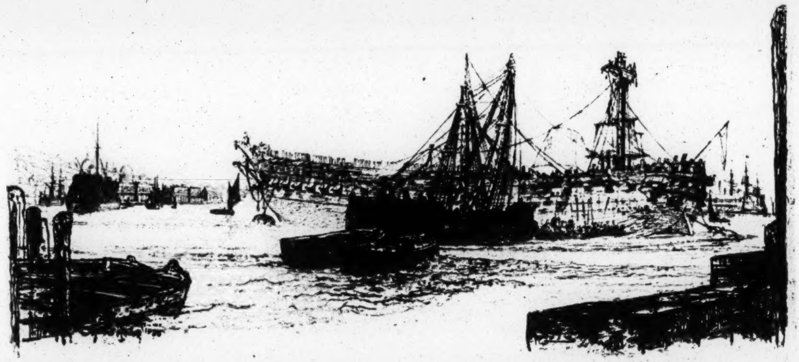

Fig. 3. "Breaking Up of the Agammemnon." Courtesy of The Metropolitan Museum of Art.

Prior to 1850, Haden was engaged in stimulating public sentiment sympathetic to the instituting of a hospital for incurables and finally in 1850 succeeded in founding and establishing the "Royal Hospital for Incurables" which was for the reception and scientific treatment of cases ineligible for admission to the general hospitals. Haden felt that under conditions more favorable to their special treatment and observations, they might turn out to be after all reparable. This institution has been considered Haden's most important contribution to medicine.

Becoming rapidly an outstanding member of his profession, his early years were crowded with activity. In 1851 he was made Honorary Surgeon to the Department of Science and Art. While he held this appointment he had been deeply interested in the founding of classes for etching and wood engraving. These classes were held at the National Art Training School at South Kensington. It was at his suggestion that the great French printer Delâtre was engaged in 1864 to assist R. J. Lane, the distinguished lithographer who conducted the etching class. However, in 1867, he tendered his resignation to the Department.

Haden was chosen to serve on the juries of the International Exhibitions of 1851 and 1862. At the Exhibition of 1851, the particular class of industry on which his judgment had been solicited was "Articles of Clothing for Immediate Personal and Domestic Use." It would seem rather incongruous that he, a man of such artistic genius, should have been found as especially fitted to adjudge the manufacture and style of wearing apparel. However, there were the hygienic details of make and the aesthetic appeal of the lovely embroidered garments from the near East, that no doubt elicited his professional as well as artistic sympathies.

In the practice of surgery, Haden was always progressive, and at the forefront of important advances. At the Exhibition of 1862, while reporting for England on surgical instruments, we find in his exhaustive account an endeavor to champion ovariotomy, then but recently introduced by the American surgeon McDowell. Among his fellow practitioners he was known for having an instinctive power of diagnosis, this potency serving him well in his capacity as Consulting Surgeon to the Chapel Royal. He became a vice-president of the Obstetrical Society of London.

He was a vigorous objector to cremation and even went so far as to invent a "papier mache" coffin, as he strongly advocated a natural "earth to earth" burial. He was a prolific writer, and published several pamphlets on the subject. Their respective titles were "The Disposal of the Dead," "A Protest against Cremation," and in 1875, he published "Earth to Earth" and "Cremation as an Incentive to Crime" (2nd edition 1892).

As a skilled and learned surgeon Haden pursued his profession until 1887, and, retiring from his London practice, repaired to the quiet neighborhood of Abersford in Hampshire, where he lived for a year. He was fortunate in securing possession of the lovely and much coveted Elizabethan mansion, Woodcote Manor, in Hampshire. It was there that he and Lady Haden took up their residence in 1889.

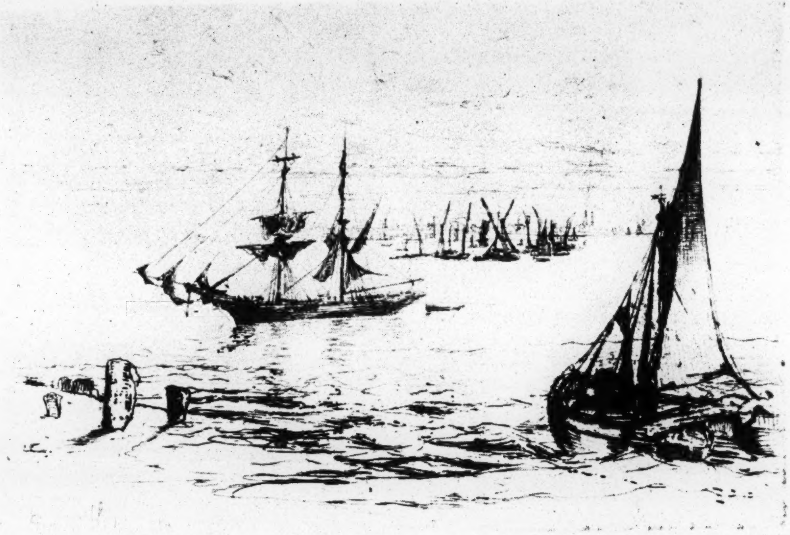

FIG. 4. "BRIG AT ANCHOR." FROM THE AUTHOR'S COLLECTION.

Haden's influence on 19th century art was to say the least effective. He was indeed directly responsible for the renaissance of painter etching at that time. Painter etching is not to be confused with line engraving or engraver's copy. The painter etcher does not aim to produce what he sees in exact detail, rather he deftly and lightly with as few lines as possible gives his spontaneous conception of an original theme. The line engraver, because of the medium with which he works, must of necessity work slowly and accurately and so we find that form of graphic art precise and exacting, and in it none of the spontaneity of etching; instead, a more or less photographic conception of what the artist observes.

To trace its earlier origin in the 15th century when facilities for transportation were slow and inadequate, we can conceive of how at once painter etching became a means of extending the artist's reputation and enlarging his market, thereby putting into the hands of persons of lesser wealth and living at a distance work as original as his paintings and at a nominal cost. For several centuries the art slumbered and Haden, having found it an almost forgotten and vague tradition of the 17th century, set about promoting its rebirth.

Of original work done in England and Scotland the names of Wilkie, Geddes of Crome and Cotman, Daniell and Turner, appear. There was at the time, however, no responsive understanding or ready appreciation. The natural outcome was lack of stimulus to practice or publish. Had it been otherwise the story of Seymour Haden's activities and influence as an etcher might have been quite different.

In Barbizon, France, Daubigney and Jacques as well as Meryon in Paris, had begun to etch. They were among the pioneers and undoubtedly exerted an influence on Haden's early sketches. Haden's more mature work suggested a new force and contrasts greatly with his earlier attempts. His change in style is attributed to his careful and constant study of the earlier masters, Rembrandt and Lucas van Leyden. Haden had always considered Rembrandt the most skilled master of lines and tone and was strongly influenced by his technique. He was largely responsible for the Rembrandt Exhibit at the Burlington Fine Arts Club in 1879, and in the same year wrote a paper on "The Etched Work of Rembrandt." He later published the following pamphlets: "About Etching," 1879; "The Relative Claim of Etching and Engraving to Rank as Fine Arts in the Royal Academy," 1883; "The Art of Painter Etchers," 1890; "The Etched Work of Rembrandt, True and False." There was in addition a lecture in 1895, and finally his presidential address to the Royal Society of Painter Etchers, 1901–1902.

The greater part of Haden's etched work was done before 1880. So far as can be ascertained the total number of plates etched by Haden since he commenced work in 1843, had been 184. This number includes work up to 1879. After that date he produced a number of mezzotints which surpassed anything done in the medium in that century. He was adept in the handling of water color, lead pencil, pen and ink, chalk and charcoal, and as H. N. Harrington has written, "Haden's etchings had proved him to be a great master in line, his charcoal drawings proved him to be almost equally great in tone." He was considered the greatest landscape etcher of the century and discovered his true capacity in the sylvan environs of London. Although he exhibited his etchings from the years 1860–1864 at the Royal Academy under the pseudonym of H. Dean, he attracted little or no attention. It was at the Paris Salon that Phillipe Burty, then a famous art critic, fully recognized his genius and acclaimed him whole heartedly in the *Gazette des Beaux Arts.* It was in Paris in 1865, a year later, that twenty-five of his etchings were published by Delâtre under the title

"Études a l'Eau Forte" and sold at 15 guineas the set. These were prefaced by Burty's praise in the text. His fame spread and he became the leader of the etching movement in England, and so we find Haden the busy surgeon thoroughly launched on his artistic career.

In 1867, Haden decided to print his plates on his own press at his home on Sloane Street. He enlisted the aid of Fred Goulding whom he discovered at the International Exhibition in 1862 and who was generally admitted to be the finest copper plate printer of his day. Haden realized that the expert printing of the plates was an essential part of the etcher's art. Extremely cordial relations existed between them from that year until the day of Haden's death in 1910.

In 1870, at fifty-two years of age, with eyes and head constantly tired by his surgical practice, Haden did his masterpiece, "Breaking up of the Agammemnon." It is considered one of the salient classics of the art of etching. It was done to redeem his promise to Mr. Hamerton for his new art magazine the *Portfolio*, the fee for which was to go to the Royal Hospital for Incurables. Owing to its size when finished, it was not issued with the *Portfolio* after all, but his famous "Brig at Anchor" was substituted. It was, however, privately published by Colnaghi and sold for five guineas the copy, a price then regarded as extremely high for an original etching. The sale was extraordinarily large, far exceeding that of any previously recorded etching. Fred Goulding had been entrusted with the printing of the plate.

In 1882 Haden visited the United States for the purpose of expounding and vindicating the importance of original etching as a fine art. He lectured in all the principal cities from New York to Chicago. At the Paris Exposition Universelle of 1889, he won the Grand Prix for original etching, and again at the Paris exposition of 1900 he received the same distinction for work in original mezzotint.

In 1891 he was honored by election to the Athenaeum, the most exclusive intellectual club in England, if not in the world. His sponsors were Robert Browning, the poet, Anthony Trollope and Matthew Arnold, the novelists, Dr. Tait, the Archbishop of Canterbury, Huxley, the famous scientist, Coleridge, Lord Chief Justice, and Sir E. J. Poynter. In 1894, as founder and first president of the Royal Society of Painter-Etchers and Engravers, Queen Victoria conferred upon Haden the title of knighthood. The Royal Academy, founded in 1768, of which Sir Joshua Reynolds had been first president, had not yet begun to honor engravers, and Haden felt keenly that beyond the knighthood, he had received no recognition, for the Royal Academy left him cold without its ranks. As France had been the first to hail him as a genius, so in his old age, she conferred upon him honors which afforded him great gratification. He was elected to the Academie des Beaux Arts, Société des Artistes Française, and in 1905, honorary member of the Institute de France.

Seymour Haden was a proud man who set high standards for himself and those with whom he came in contact. This sentiment when held within limits was a noble one although it made him intensely intolerant of others who were unable to rise to his ideals. Adamant in the opinions he formed, he heartily disliked those who pointedly brooked his. He never did anything to discredit the high social standing to which he was born. An aristocrat to the core, he felt that nothing was too good for him, from his fine collection of the best prints by older masters, his home and its appointments to the instruments he used when practicing surgery. He began life with a good name and made it immortal, for he ranks among the masters of art.

Lady Haden died in 1908 and two years later Sir Seymour Haden followed, in his ninety-third year.

[Tailpiece from Erastus: Varia Opusculum Medica. Frankfurt-a-M., 1590.]

SINHALESE AND SOUTH INDIAN CEREMONIALS IN THE PREVENTION AND TREATMENT OF DISEASE

By CASEY A. WOOD, M.D.

CHICAGO

DURING a residence of several years in the Far East (1925–1933) I spent some time in a study of Ayurvedic and other forms of native medicine. This enterprise was associated with collecting for the Medical Museum of McGill University the armamentaria of indigenous practice, especially of the Sinhalese; and these activities form the basis of this essay.*

In a previous paper† I dealt to some extent with the orthodox care of patients by the Vederala or native doctor and the literature that grew out of it; I now propose to say something about the heterodox side of Ayurvedic medicine.

It is interesting, I think, to note, in passing, that the same bastard alliance between religion and therapeutics has held sway among about the same class, and to about the same extent, among the peoples of the Orient as it has done in occidental countries.

It is of course difficult to define the attitude of the native doctor to the role played by demoniac powers in the production of disease and the ability and willingness of these evil spirits to lessen or to dispel human afflictions. That he had a firm belief in devils and their interference with the affairs of men (including the incidence of disease) there can be no doubt, but he much preferred to attempt their relief or cure by natural than by supernatural agencies. He leaned to the use of remedies whose actions he knew rather than to choose those unknown agencies (administered by others) in whom his faith was at least doubtful. Perhaps he was professionally jealous of the interference of agents of another form of practice. At any rate he regarded supernatural, priestly medicine as rather a heterodox form of cure which he tolerated but of which he did not enthusiastically approve, even when it was supposed to supplement his own efforts.

For an understanding of occult medicine in Ceylon and South India one must consider the viewpoint of the native himself.

Hildburgh (*loc. cit.*) says in this connection: Demons are of two kinds: evil spirits known as *Yaka* who form a large community governed by a King and a series of officers under him; and a species of inferior rather "benevolent devils" known as *Dewatawa*. There are an enormous number of demons in existence although only 50 or 60 of these are concerned in medical demon worship. The *Yaka* do not in person afflict their victims but "keep sight" on them with results the same as if the devils were actually present.

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* Since the present contribution deals in only a superficial fashion with the relations of astrology, "charming," devil dancing and similar agencies to Ayurvedic medicine in Ceylon and Southern India, the reader is referred further on these subjects to the excellent and well-illustrated Notes on Sinhalese Magic by W. L. Hildburgh (*Jour. Anthropological Inst.*, 1928, pp. 148); to A. Grunewedel's Sinhalesiche Masken (*Archiv f. Ethnographic*, 6: 71) and to D. De Silva Gooneratne's paper on "Demonology and Witchcraft in Ceylon" (*Journ. Ceylon Branch Asiatic Soc.*, p. 66, 1865).

† Ayurvedic Medicine in Ancient and Medieval Ceylon, by Casey A. Wood. ANN. MED. HIST., 8: 1926. In the same periodical there is an informative essay on *Olas* (palm-leaf manuscripts) and How they are Made, by Dr. Andreas Nell of Kandy.

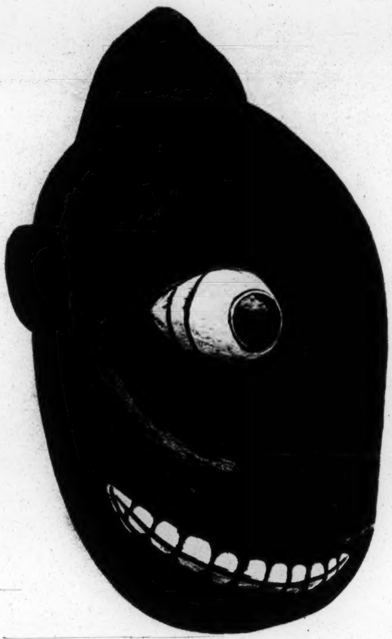

Fig. 1. Painted Wooden Mask, Worn by "Devil-dancers" to Cure Patients Suffering from Deafness. (Ceylon.) From the Collection in the British Museum.

Magic Charms and How They Are Used

Sinhalese *mantras*, or charms, are generally written in the native language or in Sanskrit or Tamil, but Arabic and other tongues may be employed or even a mixture of these; indeed a quite efficacious charm may be an untranslatable collection of meaningless phrases, words or sounds, because much of the virtue of a *mantra* resides not so much in its intelligent diction as in the peculiar arrangement of certain words and letters and in the method of its invocation. The science of "charming" is divided into eight parts, among them the expulsion of harmful demons, causing disease and death, and the power of curing disease, to each of which are assigned certain seasons, days and hours for their successful performance.

There are many forms and causes of (ceremonial) impurity, that render charms inoperable, e.g., the wearing of iron bangles and of clothing made of coconut fibre; eating forbidden food, like pork; menstruation and for seven days thereafter, etc.

Remedies after being "charmed" gain virtues not previously possessed. Thus water treated with charmed garlic is a sovereign cure for headache; while the garlic itself inserted into the external auditory meatus brings instant relief to earache.

Colors are not to be forgotten in medical magic. Black glass bangles and rings, black ropes of hair and black frames for pictures are all protective against disease.

On the other hand, black (and red) dresses should not be worn by children as they attract the attention of evil-minded demons who love such colors and are likely to inflict various diseases on their victims. Yellow and white are much used, as these devils dislike them.

Apart from the usual employment of remedies in the practice of ayurvedic medicine, curative measures among the Sinhalese include relief by means of ceremonies more or less magical or religious in character. Then there are performances that are not regarded as especially supernatural; finally, the natives are much given to the use of amulets, both prophylactic and remedial.

A prevalent idea is the transfer of the disease to an inanimate object, the lessening of the trouble by suggestion, e.g. removing or "cutting it out" in sympathy with a similar gesture by the operator; transference of certain curative virtues to a patient by the passing of objects over or about his person, by fumigation, by sprinkling him with charmed water, by tying charmed strings to some particular part or parts of his body, etc.

A few of these agents and agencies will now be briefly considered.

"Charmed" Medicines. By way of assisting the curative actions of ordinary remedies (presented or not by the Vederala) these agents were charmed. In this state they were highly regarded by the Sinhalese. In several olas that form part of the McGill Collection recipes for several "reinforced" medicines are given, as well as the *mantras* needed for their ceremonial preparation.

Curative Threads. Two examples of medical treatment by these agents (further fortified by the blessings of a priest) are well described by Hildburgh (*loc. cit.*, pp. 176 and 177). A "decorated" chair having been prepared, several saffron-colored threads are hung on its back and ceremonially charmed. The operator then removes them from the chair, repeating meantime a *mantra* suited to the occasion. The threads are now laid upon the patient's head and a *mantra* recited over them. He then ties one thread around the sufferer's neck, allowing two others to rest on a shoulder and arm, meantime holding a third in front of the body. A remaining thread is then tied about the patient's waist. In each instance, during the tying and placing of the threads, a *mantra* is recited.

Another effective method of relieving distress is by means of the *epa-núlá* or "bail-thread," so called because the patient is rescued or "bailed out" from the power of the demon who is afflicting him. A saffron-colored thread is knotted seven times, with an appropriate mantra for each knot, the knot being drawn a little closer at each repetition until the seventh is pulled quite tight. A vow is now made to the afflicting devil that when the sickness has been removed the thread will be washed away by the patient who will then throw it into running water or have it purified by burning in the flame of a magic torch.

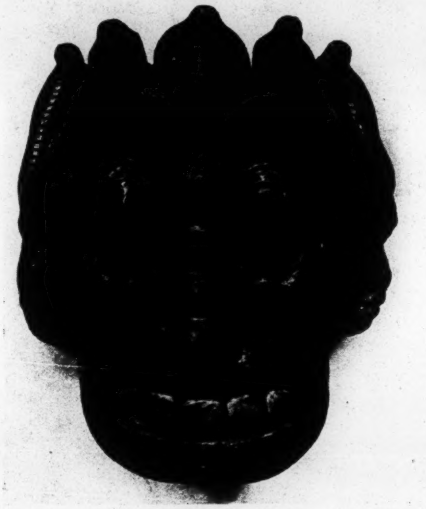

FIG. 2. PAINTED WOODEN MASK (OR MUNA) CROWNED WITH FIVE COBRAS, WORN BY "DEVIL-DANCERS" TO CURE DISEASE. (CEYLON.) FROM THE COLLECTION IN THE BRITISH MUSEUM.

Relief or Cure of Disease by Invoking the Aid of Deities. These ceremonials are quite picturesque and are carried out with a meticulous regard for traditions centuries old. They have a familiar resemblance to the formal display of Christian relics to an afflicted person accompanied by invocations (prayers) to certain deities (saints).

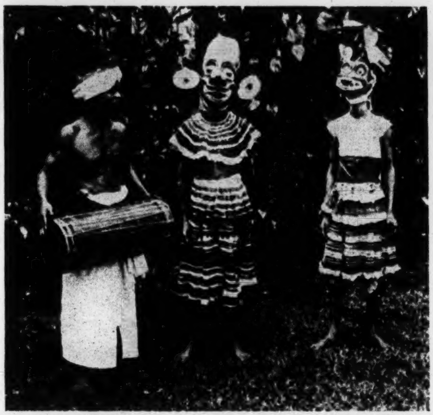

FIG. 3. PROPERLY MASKED SINHALESE DEVIL DANCERS, ACCOMPANIED BY THE NOTES OF THE "DEVIL'S DRUM" AND EXHORTED BY APPROPRIATE INCANTATIONS, EXORCISING THE DEMONS OF DISEASE.

Elaborate ceremonies are performed to arrest serious bleedings, to counteract the "overlooking" of the evil eye as a source of injury or disease; to cure hydrophobia, toothache, dysentery, insomnia, warts, drunkenness, snake-bite, and an extensive roster of other affections, including diseases of children and those peculiar to women.

A recent writer for the press draws our attention to similar exercises in the Dutch East Indies. He says that in common with most native tribes, those of Sumatra practice a homely kind of medicine, consisting in the application of simples, but in both the prevention and the cure of disease they put their faith chiefly in the use of charms. These are recited to ward off the attacks of adverse disease-inflicting spirits, and for exorcizing them should they have succeeded in gaining possession. The incoherent verses are often accompanied by fanciful drawings as seen in a book of charms from Sumatra. These books are also consulted in the divination rites which form part of Indonesian religio-medical practices in general.

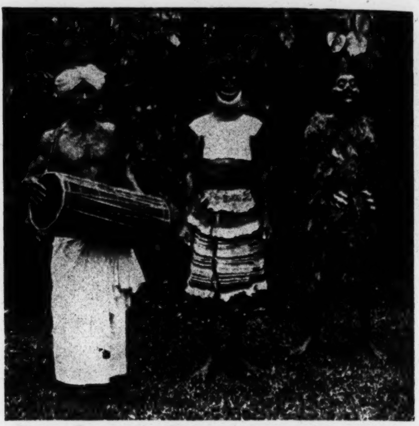

FIG. 4. SINHALESE DEVIL-DANCERS, APPROPRIATELY MASKED AND COSTUMED EXORCISING THE DEMONS OF DISEASE WITH THE AID OF NOTES FROM THE TOM-TOM (*yak-beraya*) AND OF THE PROPER INCANTATIONS. THIS DRUM WAS MADE OF THE TRUNK OF A TALIPOT PALM TREE, HIGHLY POLISHED, PAINTED AND LAQUERED. THE DRUMHEAD, OF MONKEY SKIN, IS ALWAYS BEATEN WITH THE FINGER TIPS.

There is in Ceylon a ceremony intended to obtain relief from epidemics, especially those attacking villages, that recalls European priestly processions headed by a saintly relic, sacred picture, a particularly holy ikon or some other Christian idol. The Sinhalese ceremony is a long, complicated and tedious one that cannot be described here but the principals in the ceremony are an operator called a *Kapawá* and the picture of a *Kandaswámi*, a benevolent deity, who when properly approached and implored, *may* drive away the malignant devils of disease.

Amulets as prophylactics are employed in Ceylon and Southern India much as they are in European countries; but many objects are, like our lucky stone and rabbit's foot, also carried about the person as mascots without any special reference to the prevention of disease.

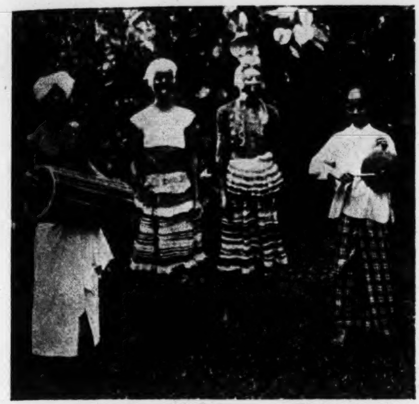

FIG. 5. TWO MASKED SINHALESE DEVIL-DANCERS, ACCOMPANIED BY THE NOTES OF THE "DEVILS DRUM" OR *Yak-beraya* AND OF A CEREMONIAL GONG. ONE DANCER CHANTS APPROPRIATE INCANTATIONS, EXORCIZING THE EVIL SPIRITS OF DISEASE FROM THE BODY OF THE SUFFERER.

These articles must not, of course, be confused with the charmed and blessed therapeutic amulets already mentioned that are worn to ward off physical and mental ailments.

Charmed black-glass bangles (for children), strings of bright-colored seeds, bracelets of hair, ola-leaf *yantras* (written charms) and many other preventives and curatives are carried about the person of numerous Buddhist and Tamil Sinhalese of all ages and sexes. Charmed rings are also favorite amulets.

The intervention of one or all nine planets in protecting the wearer from disease and violent death may be invoked by the nine-jeweled *Nawaratna* ring, often worn by the devout among the higher class Ceylonese. This ring must, however, be properly charmed by a long and tedious ceremonial process in which the priest plays an important (and expensive) role.

After reading the foregoing it may well be understood that the medical charmer was, in all his varieties, an individual apart. In medieval times he was generally an official of a temple or a monastery, with semi-priestly inhibitions and duties; in more modern times he became a sort of long-haired "professor" or "medicine man," an essential professional performer at ceremonials.

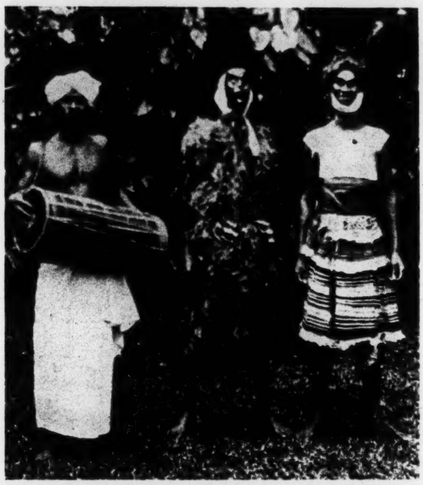

FIG. 6. SINHALESE DEVIL-DANCERS, APPROPRIATELY MASKED AND COSTUMED, EXORCIZING THE DEMON OF BLINDNESS BY THE AID OF CERTAIN PRESCRIBED INCANTATIONS AND THE WILD NOTES OF THE DEVIL'S DRUM, OR *Yak-beraya*.

In the literature of this subject one finds many *mantras*, several hundred of which the charmer must learn accurately by heart.

The powers of the professional charmer covered a very wide dominion, one of the most elaborate, long-drawn-out and costly being the production of serious disease or death in an enemy. There were, of course, many different methods of accomplishing these ends.

The most potent lethal *yantra* in the present Collection is engraved on a copper sheet and is of medieval origin. It is furnished with necessary diagrams and gives (among other potent prescriptions) directions for accomplishing the death of an enemy in three days!

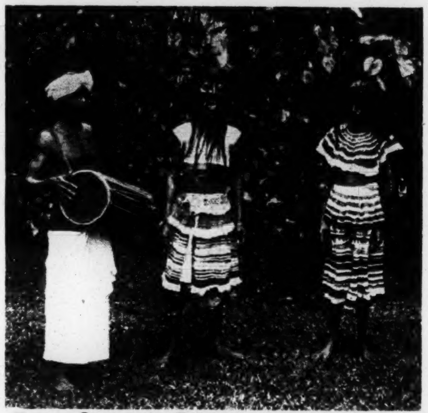

Fig. 7. Sinhalese Devil-dancers, Accompanied by Appropriate Incantations and the Notes of the Tom-tom, or *Yak-beraya*, Exorcizing Evil Spirits from the Person of a Sufferer with Fever. The Central Figure Wears the *Sanni-yaka*, Regarded as Very Efficient in the Ceremonial Treatment of Many Diseases.

Devil-dancing in the Treatment of Disease

The explanation of the *modus curandi* in this picturesque form of remedial ceremony is not so simple as one might expect; it is, in fact not altogether an attempt to *expel* the demon of disease.

Hildburgh (*l.c.*) has in part this to say on the subject:

> Some of the devils represented by the devil-dancer with the aid of a costume appropriate to the treatment of the disease under consideration, are the devils who are actually afflicting the patient; others are powerful devils by whom the afflicting devils are controlled and, in the ceremony, these demons are ordered to depart; others are said to be devils who are afflicted as the patient is afflicted and are invoked to suggest to the afflicting devil that he will transfer his malignant influence to them, in the expectation that he will have a sort of brotherly compassion (as a fellow devil) upon them and after leaving the man, will further inflict neither them nor him.

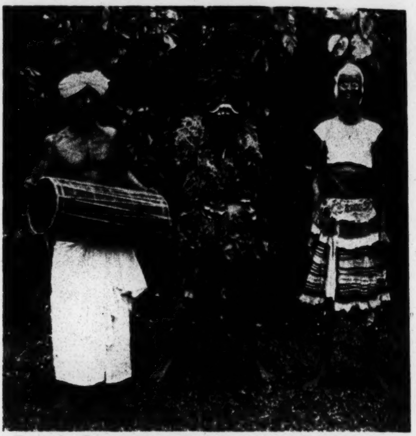

Fig. 8. Sinhalese Devil-dancers, Masked and Wearing Appropriate Costumes, Expelling the Demons of Disease by the Aid of the Notes of the "Devil's Drum" or *Yak-beraya* and Certain Prescribed Incantations.

The implements, costumes and masks in the dances vary not only with the island districts but with the circumstances of the owners. The present Collection possesses several of these masks, each one intended for the exorcizing of a particular disease-producing devil.

Thus, the exorcizer who was engaged in "treating" a case of blindness must wear during the ceremonial performance the mask pictured in Figure 6; in the case of a fever, another mask; for snake-bite still another, while a grotesque mask (see Fig. 7) was quite effective in several different diseases; and so on.

These costumes are barbaric combinations of red, black, dark blue or (and) white fabrications mingled with all sorts of gold, silver and brass amulets and ornaments.

Masks, generally carved out of single blocks of wood and hideously painted are regarded as very important in the process of deliverance from the evil spirits of disease. Most of them are horrible objects, with bulging eyes, painted faces, projecting teeth and long, black hirsute appendages. The devil-dancer, wearing the costume and mask that tradition has through the centuries established as proper, chants *mantras* appropriate to each occasion and, in keeping with his masked face, dances about to the accompaniment of a tom-tom or a gong. The accompanying illustrations will show parts of several performances, as exhibited by professional dancers in Kandy.

The number and pay of the devil-dancers employed in the treatment of a patient depend, as one might guess, upon the wealth of the patient and the seriousness of his disease. R. L. Hildburgh says that during the dancing the operator recites "devil's verses" (*yak-kavi*) that furnish the name, parentage, birth, history, attributes, etc. of the afflicting devil, thus showing said demon that he (the dancer), is the "knowing one," is in fact the more powerful and that his demands must be met.

If the regular Vederala has failed to cure a patient and the devil-dancers have been called in and a favorable result follows, the dancers expect to be and are in general liberally rewarded. On the other hand, if a cure is not obtained by the intervention of these powers of darkness the dancers, as a rule, receive no fee.

Horoscopes and other developments of astrology have always been regarded as of extreme importance in Sinhalese life, of which protection from disease has ever played an important role.

The native's first horoscope, a *welà-pat-kada* or "time-leaf-piece," is generally written on an ola-leaf, or in modern times on a sheet of paper. This document is rolled up and carefully preserved in some suitable case. This first study of a person's astrologic future forms a basis for future observations and magical deductions.

As I pointed out in a previous paper (*loc. cit.*) surgery plays a very minor

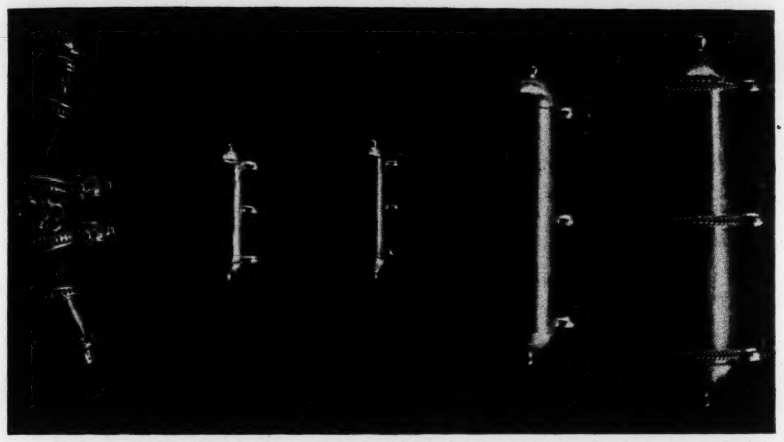

FIG. 9. SILVER AMULET OR *Mantra* CYLINDERS FOR HOLDING CHARMED OLAS AGAINST VARIOUS ACCIDENTS AND DISEASES. BELOW IS A CHARMED OR "BLESSED" SILVER-MOUNTED TIGER TOOTH, A REVERED PROTECTION AGAINST CERTAIN AILMENTS.

part in Ayurvedic remedial measures. When called into play, an operation, however trifling, was regarded as a very serious matter. For example, the opening of an abscess required a "charmed" gold knife made by thinning and sharpening a small nugget. Iron or copper must never be used. Perhaps the main reason for this prohibition of base metals is that the knife became the property of the operator, Vederala or priest.

The use of a *yantra* called *Ratana* reminds one of the *ikon* of the Greek church or of the household shrine of a Roman Catholic domicile or of the framed prayer seen in some Protestant homes. The Sinhalese symbol is kept in a sort of small cubicle made of white cloth which protects it from dust and dirt, in front of which a little incense is burned each evening. This display of reverence is very pleasing to certain deities who extend their protection to the house from disease and other evils and especially guard it and the occupants from the danger of lightning.

One finds displayed in Hindu temples, just as in certain Christian churches, the similitudes of human organs (eyes, tongues, leg, arms, etc.) or parts afflicted by disease, for the purpose of getting rid of the latter, or as votive offerings in gratitude for a cure. The offerings are generally of silver (sometimes of gold) that eventually find their way into the melting pot to the advantage of the temple treasury.

In the Far East the spiritual states or attitudes of ninety-nine hundredths of the native population closely resemble that of the English people during the Middle Ages. As Conan Doyle says of the latter:

> Heaven was very near to them in those days. God's direct agency was to be seen in the thunder and the rainbow, the whirlwind and the lightning. To the believer, clouds of angels and confessors and martyrs, armies of the sainted and saved, were ever stooping over their struggling brethren on earth, raising, encouraging and supporting them.

The study of oriental medicine, involved as it is in the religious beliefs of the Eastern sages, convinces one that the ecclesiastical machinery, millinery, as well as the imagery and supernatural concepts of oriental lands finds close analogies to and parallels in the beliefs and practices of European countries. It must follow, therefore, that the missionary enterprises of European countries appear to be largely a transport of religious coals to a far-off Newcastle.

After all, the consolation, the comfort, the uplift, and help that the troubled soul of all lands draws from a faith in and communion with the unseen powers has nothing to do with their actual existence. In that regard it makes no difference whether there are or are not anywhere gods or demons, saints or martyrs, for the heathen in his blindness gains merit and finally acquires Nirvana with exactly the same joyous satisfaction to himself and his friends as the "saved" of western lands ascend to their bright heaven of blue.

BARON SHIBASABURO KITASATO*

By HERBERT FOX, M.D.

PHILADELPHIA

IT is fitting that this Society devote respect to the passing of nearly the last of the great group of scientists who revolutionized modern medicine and hygiene in all their branches. Shibasaburo Kitasato, Baron of the Japanese Empire, Doctor of Medicine, leader of thought in modern medical life of Japan, most prominent in investigative and practical public health, and a scientific executive, died June 13, 1931, at the age of seventy-five. His personal life was interesting and full of experiences but his contributions to human welfare stand out from his earliest achievements.

Shortly after accomplishing his medical preparation he entered the public service of his country, but in 1885 he seems eagerly to have accepted the assignment of his government to go to Germany, a country that was inviting foreign students and where there were such great figures as Virchow, Cohnheim, and Klebs, whose far-reaching thoughts were followed by such practical workers as Gaffky, Koch, Ehrlich, Brieger and Loeffler. He was sent to the Institute for Infectious Diseases, under Robert Koch. This world into which he stepped had the background of scientific vision supplied by Villemin, Pasteur, Roux and Nicolaier. With such company and at that time of the birth of the newly applied bacteriological science, it is small wonder that he began at once under the direction of Koch to systematize the knowledge of the cultivation of intestinal bacteria, particularly those of cholera and typhoid. His first publication seems to be an account of dysentery in Japan which was published in a periodical of that country in 1886; this was possibly written while in Germany. His first public appearance seems to have been before the German Congress of Hygiene and Demography in 1887, where he discussed cholera in Japan.

The early work at the Institute did not begin to appear until he had been there for at least two years, whereupon a flood of articles was published, chiefly in the *Zeitschrift für Hygiene*, the important journal edited by his chief. The publications concerned methods of cultivation and the physiology and chemistry of the saprophytic life of some recently discovered pathogens, all leading to the remarkable elaboration of the technique for growing in pure form the spore-bearing tetanus bacillus, which, although grown four years previously by Nicolaier, had never been obtained in pure culture.

Then came a period, beginning with a world-famous publication in 1889, that lasted until Kitasato's return to Japan in 1892, during which time eleven articles appeared bearing upon tetanus. It is noteworthy that but one of these, that in December, 1890, in association with Behring, directly concerns diphtheria. The first article on tetanus, though published in the *Zeitschrift für Hygiene* in 1889, was also given that year before the 18th Congress of the German Surgical Society.

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* Read before the Section on Medical History, The College of Physicians, Philadelphia.

In this article he describes the confirmation of the work of Nicolaier and the steps followed in that first pure culture of this spore-forming bacterium. Two and three years later his articles on tetanus describe the nature of the poison and the result of immunization of various animals. Mixed in with this work on tetanus there were two important articles on the nature of toxins and toxin resistance, in association with Brieger and with Wassermann.

The contributions of Kitasato to the understanding of poisons seem to consist in his practical testing of the cultures that came to his hand, and to the applications of the chemical extracts conceived and isolated by Brieger (1888). None-the-less, he seems very early to have realized that there was a similarity between the growth and action of the bacteria of tetanus and of diphtheria. In his first work he suggests what he later demonstrates in his second article, that there was a separable toxin of the tetanus bacillus. One of his contributions, and perhaps the most important, showed that in the transudates in the bodies of tetanus cases, toxin existed, and this demonstration, as in the case of diphtheria, proved that this toxin was not destroyed within the body. There seems no doubt that Kitasato himself, Schütz, Behring, Casper and others made application of this principle in the successful protection of guinea pigs against tetanus and by the injection of larger animals to produce immunity in them. Just where arose the principle of the injection of rising quantities of toxin to produce immunity is not clear unless it be an application of the principles of Pasteur; it certainly seems not to have arisen in the group and at that time of which we write. There seems little doubt that from Kitasato's work came the practical application of Schütz, Casper and others of the tetanus toxin-antitoxin idea.

The value of Kitasato's contributions to the development of the diphtheria toxin-antitoxin idea have been protested and contested. Now that so long a time has passed, so few of the contemporaries of the time remain, and so firmly have certain names become associated with the idea, that perhaps the question will never be settled. A series of acceptable facts, however, might be put down in order, their sequence suggesting who supplied the basic work, proof and possibly the theory.

In 1884 Loeffler described the diphtheria bacillus and suggested that it had a peculiar poison. In 1886 Theobald Smith demonstrated the filterability of the poison of hog cholera and showed that a resistance to the disease could be obtained by the injection of rising quantities. In 1888 Roux and Yersin demonstrated the filterability of the diphtheria toxin, its method of production and its quantitative toxicity, and they suggested its antidote. During the years 1884 to 1888 several articles appeared from Behring that had to do with the protection against the bacillus of symptomatic anthrax, the pus organisms, and diphtheria bacilli, by the use of iodine, mostly in the trichloride form; silver solutions were also used sometimes. His idea up to 1889 seems to have been the disinfection of the body or neutralization of the poison by the injection of chemicals and indeed certain of his animals did recover from experimental infection and remained healthy after a later experimental injection of bacilli. It is well known that guinea pigs may sometimes recover from the injection of virulent diphtheria bacilli and remain resistant thereafter. While Behring's controls are clear it is not always possible to check the toxicity of the cultures and fluids that he used.

On December 4, 1890, there appeared that epoch-making statement by Behring and Kitasato that the toxins of the two diseases are similar, that the toxin was not destroyed by the body, that antitoxin was formed in the blood and that these observations suggested a solution of the diphtheria problem. The subject matter of the paper is mostly concerned with tetanus and its poisons. Yet the article contains one sentence of great significance, not only for its direct meaning but because it is not wholly consistent with published work. "Aber erst bei der Anwendung der, bei der Diphtherie gemachten Erfahrungen, auf den Tetanus sind wir zu Ergebnissen gelangt, die, soweit wir erkennen können, an Beweiskraft nichts zu wünschen übrig lassen." This means that the basic experience was with diphtheria, the principles being thereafter applied to tetanus. Kitasato did not work with diphtheria. Behring's diphtheria work in 1888 did not concern itself with the relation of free toxin and of blood serum antitoxin automatically made by the body, but he attempted to destroy the poison by chemicals. Kitasato's publication early in 1889 reveals that he had a strong support of the facts concerning the neutralization of toxin by body fluids.

One week later, December 11, 1890, Behring published alone an article concerning diphtheria in which he develops the entire idea as referring to this disease and acknowledges the similarity to the previously described tetanus poison.

In 1890 the practical application of tetanus injection into the large domestic animals was undertaken by Behring very largely influenced by Schütz and Casper. Kitasato seems to have had no direct hand in the plans to immunize large animals as a therapeutic measure or for antitoxin production.

Wernicke comments upon the fact that Kitasato emphasizes the disappearance of the tetanus bacillus within the body and the origin of tetanus antitoxin in the same bodies. Wernicke further states that it is surely no accident that Behring, associated with Kitasato at the time, noticed this bacterial poison and made it the burden of further studies in his particular disease, diphtheria, toward immunity, protection and cure. He, however, believes that the disinfection work with iodine, carried on for some years by Behring, naturally led up to the application by him of this toxin newly found by Kitasato and it seems that from Kitasato's work Behring first correctly estimated the value of the body fluids, particularly the blood, in the process of immunization. Behring, however, ascribes to Wernicke the major assistance in the application of the diphtheria toxin-antitoxin idea and assigns to Kitasato only a casual association in the demonstration of free toxin and antitoxin.

Thus it would appear that the understanding of the tetanus-diphtheria group dates from Kitasato's record of the fundamental observation of tetanus toxin and antitoxin. Where originated the decisive thoughts must remain finally unsettled, but without the proof in tetanus perhaps the proof in diphtheria might have been delayed or discovered otherwise. The work-plan on the subject Kitasato ascribes to the thoughts, suggestion and guidance of Koch.

Upon his return to Japan in 1892 Kitasato started off with a series of articles in the native language describing the then modern theory of immunity that later became crystallized by Ehrlich.

As we know from his history, he became very shortly the head of the institute for infectious diseases established largely through the generosity of a friend but confirmed in authority by the crown appointment of Kitasato as its director. This institute, five years later, became a division of the Department of the Interior, after which it grew to greater and greater importance until some years later it was divided into three parts: the experimental and diagnostic division of infectious diseases, a lymph institute and a serum institute.

Kitasato's publications from his return until 1912 cover a variety of subjects that concern public control of infectious diseases. There were very few articles of strict laboratory bacteriology. Two subjects, plague and leprosy, form the next big contributions of Kitasato's professional life.

In 1894 he was commissioned by the Japanese Government to investigate the plague in China, whither he went with Aoyama. Within a week he was able to see the plague bacillus in the autopsy material under the hand of Aoyama. This he wired to Koch, who replied with a question as to its cultivation. Within another week he had succeeded and in a short time had demonstrated its pathogenicity to the lower animals. He announced the discovery, with a short but thorough description of the disease, by letters appearing in a pamphlet in Japanese text and in the *Lancet*, *Practitioner* and *Reports of the U.S. Marine Hospital Service.**

Perhaps this discovery alone, although the present chronicler does not agree perfectly with the view, has caused certain writers, notably Miyajima and Eckstein, to speak of him as one of the great bacteriologists of the world. It seems to the present writer that the care, precision, foresight and completeness with which he described the tetanus bacillus earned him a place in the sun before 1894, with a brilliance that may have been somewhat dulled by the aggressive publicism of certain colleagues.

Another great contribution at this time about pest concerned his organization of the hygienic regulations regarding plague. He seems to have been responsible for the hygienic regulations against rats and their fleas, and the transport of the disease by trade movements. To what extent he is indebted to the English authorities and to Haffkine and Yersin is not clear, but his survey published in St. Louis in 1907 convicts the rat, particularly in grain and cotton, and emphasizes the necessity of catching rats in their natural hiding places, and the construction of boats and storing places to prevent the spread of the animal. He also shows the value of vaccine in Japan. Kitasato contributed seven articles on the hygienic aspects of this disease during the years following his preliminary announcement of the discovery of its cause.

Aside from his attention to the important epidemic diseases he wrote extensively on the pandemic diseases that affected Japan. His observations concerning tuberculosis in the country were interesting in that they help to support Koch's idea that bovine tuberculosis was of no consequence to man. He showed that the meat and uncooked milk of cows was not used in Japan. Furthermore native cattle did not have the disease, while imported animals did. Later on at Koch's suggestion, he and one of his assistants reported that 152 consecutive pulmonary tuberculosis cases gave positive human cultures. It is interesting to observe that he did not include in his series tuberculosis of the bones, joints and meninges. Had he done so perhaps other figures might have been obtained.

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* See Bibliography for year 1894.

His observations on leprosy contain little that was new, although he emphasized the possibility of the transmission of the disease from nose to nose, the carrier probably not having any recognized leprous lesion.

Kitasato's scientific and hygienic publications seem to have ceased in 1912 because there is not to be found since then an original article by him in the Index Medicus, Surgeon General's Catalogue or Cumulative Index. The list of publications sent to the writer by Dr. Miyajima and added to this memoir, include three literary products of his which seem not to have been included in American reference books.

As one reviews his scientific life the following contributions will always be remembered as coming from Kitasato, possibly because of the early influence of a magnetic personality and powerful leader, but surely because he was of the scientific character to use his gifts and his opportunities to deliver services that have given to the world real weapons to fight disease. In the first place his descriptions of communicable and epidemic diseases are complete, clear, forceful. His management of the hygienic activities of Japan earned the recognition of his Mikado, his countrymen and of the entire world. Kitasato's elaboration of the simple measures necessary to isolate spore-formers has been of inestimable value to the practical bacteriologist and to the hygienist. His demonstration that tetanus is due to a filterable toxin, that the toxin is in the body, that exudates may contain it, that the blood may acquire protective properties, all form a group of observations that made possible an understanding of the toxin diseases and the elaboration of antitoxic serum. His discovery of the pest bacillus insured his undying fame.

The personal life of Kitasato began in 1856 at Ogunigo, Southern Japan, in apparently humble circumstances. He was graduated from the medical school at Kumamoto under Prof. Mansfeld, the German who was then in charge. He spent some time in Tokyo after this, whereupon he entered the service of the public health bureau of the Department of the Interior. In 1885 he was sent to Germany where he remained until 1892. Just before leaving, the German government conferred upon him the title of "Professor." He was at this time the recipient of several offers to become the head of a department in Europe, but, acting upon patriotic impulse, writes Miyajima, he decided to return to Japan. Upon his return to his native country, he began an agitation for the establishment of a laboratory comparable to that which he had left. A friend, Mr. Fukuzawa, personally provided the building and money to begin, and shortly thereafter other public-spirited citizens assisted and the government made certain appropriations. This institution was taken over by the government in 1899 and continued under Kitasato's direction until 1914, when, by reason of Imperial action, the director was not satisfied and resigned with all his assistants. He began a private institution at that time which has remained the Kitasato Institute to the present. He founded and was editor of the *Archives of Experimental Medicine*, the well-known publication; it was filled for a while by the work of his own institute. He was interested in the medical department of the reconstructed Keio-Gijiku University where he organized a new medical faculty. In 1917 the Emperor appointed Kitasato a member of the House of Peers and in 1924, in recognition of his public service and his merits in science, he was made a baron.

During the last fifteen years of his life his major public work seems to have been in organizing the medical profession in Japan, in which he was influential in systematizing the education and registration of medical practitioners.

Kitasato did not often leave his native country during the later years but at the height of his middle Japanese life he went twice to Europe and came once to this country. Those who met him found him a kindly but forceful, simple-minded, direct man. It seems certain that he had the qualities of the director, the leader, the clear-thinking executive, and he was able to cement to himself the friendship and loyalty of a vast number of assistants and associates who worked with him. For nearly all of the information concerning Kitasato's personal life I am indebted to the writings of Dr. Mikinosuke Miyajima. Those who are interested in the minor parts of Kitasato's life may find in these writings a full description of all its happenings. The value and effect of his scientific labors can be seen in a perusal of the bibliography that can be assembled in this country. All the significant articles appear in German or English, many being also published in Japanese. The publications in other languages seem to be repetitions or abstracts.

Such was the life and labor of Baron Shibasaburo Kitasato. He seems to have been actuated by a desire to do practical work and he seems very definitely to have been activated by patriotism. His pride was Japanese and personal but extended to his position as a medical man, for he would resign a crown position rather than have it subjected to the discretion of others without his acquiescence. He was proud of achievement too. I have it from Professor Aschoff that Kitasato was proud of the production of all kinds of biological products in Japan, requiring no help from afar. Miyajima calls attention to the fact that in our early days of occupation in the Philippines, when we could not supply the necessary hygienic products, Kitasato took pains to supply the deficiencies.

Throughout his whole life he illustrates how one may think and work for the common good and leave an undying fame. The chronicler's grateful task, to record some appreciation of one of the world's worthies, is done.

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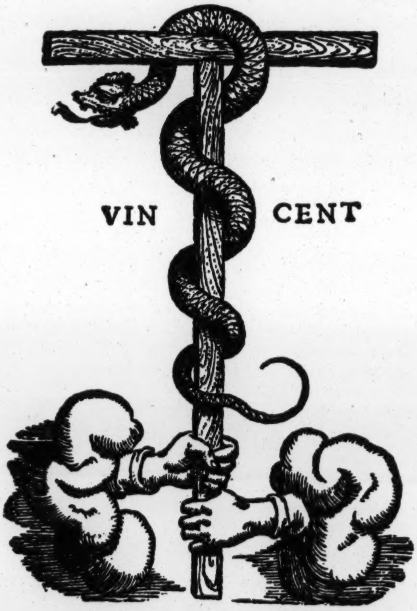

[From Matthioli: Senensis Medici, 1570.]

HISTORY OF THE STOMACH TUBE

By RALPH H. MAJOR, M.D.

KANSAS CITY, MO.

ADOLF KUSSMAUL, whose name is linked with many important events in the history of the healing art, is usually given the credit for having introduced gastric lavage into the practice of medicine. While Kussmaul's advocacy of gastric lavage may be said to have established this method of treatment in medical practice, the procedure was employed and described many centuries before the appearance of Kussmaul's paper in 1869.

The procedure of introducing a foreign body into the pharynx or esophagus for the purpose of emptying the stomach was very frequently described by ancient writers, both medical and lay. Nikander's celebrated poem "Alexipharmaca," or antidotes for poisons, describes such methods. This poem as translated by Joannes Gorrhaeus contains the following verses on the treatment of poisoning with buprestis:

Pinguis & interdum tepefacti potus olivi
Provocet ad vomitum, atque immissis ora lacessens
Coge recusantem digitis, pennaque, recurvoque
Et modica intorto fauces purgante papyro.

[Sometimes a drink of fat and tepid olive oil
Provokes vomiting, or force the unwilling mouth
With a thrust of irritating fingers, by a feather
And by empting the gullet with a small twisted and curved paper.]

Jacques Grévin has rendered the above passage into sprightly sixteenth century French verse in his delightful translation of Nikander.

His translation reads:

Tu lui feras aussi boire l'huile atiedie
Jusqu'au vomissement: & encores tu dois
Lui mettre malgre lui en la bouche les doits,
Ou quelque plume, ou bien quelque fois tu peus prendre
Du papier courbe et tors, lequel lui fera rendre,
Attirant du gosier, tous ces maus dangereus.

The Romans, as is well known, in their later decadent days, spent much of their time at their feasts, gorging themselves with immense quantities of food. The dinners which Samuel Pepys and his friends consumed leave the present-day reader amazed at the hearty British appetite of the seventeenth century. Yet they were hardly more than a generous hors d'oeuvres course in the Roman dinner of the Empire days. The Romans, to escape the after-effects of their herculean gastronomic efforts, commonly employed the *pinna* or "vomiting feather" at the end of a feast. Indeed, we are informed by reliable historians, that they also often used the *pinna* after one course, to make room for the course to follow. The *pinna*, before using, was often dipped into some nauseous mixture to increase its effectiveness.

Suetonius in his "Life of the Caesars," discussing the habits of the Emperor Claudius Drusus Caesar, wrote: "lightly you should never have him go out of the dining room but with his belly strutting out, well whittled also and drenched with wine: so as straightway, while he laid him down along upon his back and took a sleep gaping, there was a feather put ordinarily into his mouth, wide open for to discharge his stomach."

Oribasius, writing in the fourth century, gives us what is probably the first description of a stomach tube. In discussing the methods of inducing vomiting the following interesting passage is found:

> Glove fingers are stitched together from Carthaginian leather or something else very soft, the length of ten or twelve fingers, like a finger, six fingers length is stuffed with wool, the rest indeed the length of four fingers remains empty: It is applied to the finger, it as aforesaid is smeared with ointment and introduced into the stomach.

This description is fairly clear. The instrument was round, hollow, made of soft leather filled with wool in the lower portion and hollow in the upper part so the finger could be introduced into it. The purpose was obviously to introduce such a sound into the stomach or probably from its length only into the esophagus and to provoke vomiting by mechanical stimulation. The stomach contents obviously did not escape through the lumen of the sound, and the instrument was probably withdrawn when the patient began to vomit. This instrument was a kind of artificial finger, designed after the pattern of a finger but much longer so that it reached not only into the pharynx but down into the esophagus or into the stomach itself.

Instruments of this type were called "*lorum vomitorium,*" frequent reference to them being found in the works of the old physicians. Scribonius Largus recommended "water mixed with oil in wine, frequently given and frequent vomiting produced by a *pinna* or a *lorum vomitorium,*" in cases of opium poisoning. Hieronymus Mercurialis in his "De venenis," discussing the "treatment of poisons taken by mouth," refers to the *lorum vomitorium,* which "I openly confess I am ignorant of, I conjecture however the *lori* which were used by Doctors and druggists to be of some kind of leather, which introduced into the mouth provoked vomiting."

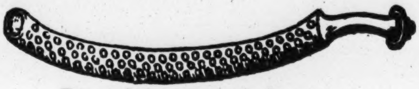

FIG. 1. INSTRUMENT OF ARCULANUS.

The further developments of this instrument are described in the works of Arculanus, Ryff, Scultetus and Fabricius Hildanus. The uses for the instrument increased, it was not only for emptying the stomach but also for forcing food down into the stomach and particularly for extracting foreign bodies from the esophagus.

Johann Arculanus, professor at Bologna and Padua described in his treatise of surgery published in 1493, an instrument for forcing food down into the stomach. He wrote "therefore if it does not descend, it is our practice to introduce into the mouth an instrument fashioned like that below. This instrument indeed may be of lead with a sort of snare, is long and has a curve to it." The instrument of Arculanus is shown in Figure 1.

The famous case of Thomas Willis whose patient used an improvised sound, is a striking testimonial to the ingenuity of that physician and to the persistence of the patient. Willis wrote:

> A strong man, and otherwise healthful enough, labouring for a long time with often Vomiting, he was wont, very often, though not allways, presently to cast up whatsoever he had eaten. At length the Disease having over-

come all remedies, he was brought into that condition, that growing hungry he would eat until the *Oesophagus* was filled up to the Throat, in the mean time nothing sliding down into the Ventricle, he cast up raw (or crude) whatsoever he had taken in: when that no Medicines could help, and he languished away for hunger, and every Day was in danger of Death, I prepared an Instrument for him like a Rod, of a whale Bone, with a little round Button of Sponge fixed to the top of it; the sick Man having taken down meat and drink into his Throat, presently putting this down in the *Oesophagus*, he did thrust down into the Ventricle, its orifice being opened, the Food which otherwise would come back again; and by this means he hath daily taken his sustenance for sixteen years and doth yet use the same Machine, and is yet alive, and well, who would otherwise perish for want of Food. Without doubt in this case the Mouth of the Stomach being always closed, either by a Tumour or Palsie, nothing could be admitted into the Ventricle unless it were violently opened.

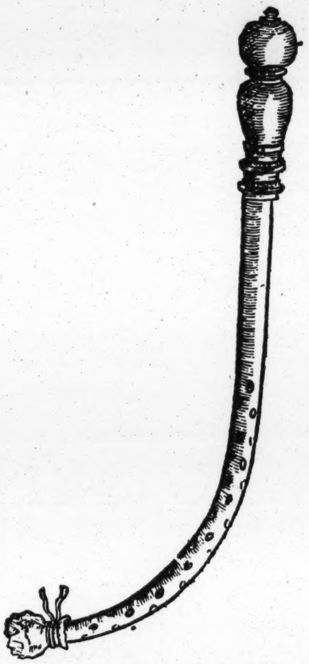

Fig. 2. Stomach Sound of Fabricius Hildanus.

We can not be positive as to the cause of this regurgitation. The duration of the illness would make the diagnosis of a tumor in the stomach very improbable. Thomas Willis, that keen observer of clinical symptoms, who has left several first descriptions of disease, almost surely described here a case of cardiospasm. It is also probable that he was first to employ esophageal dilatation in its treatment.

The stomach sound was also extensively used in the extraction of foreign bodies from the esophagus. Many of the leading surgeons of the sixteenth and seventeenth centuries refer to it. Wilhelm Fabry of Hilden, better known as Fabricius Hildanus (1560–1624), the "Father of German Surgery," describes in his "Century of Surgical Cases" such an instrument and illustrates it with a woodcut (Fig. 2).

Hildanus writes:

> It is moreover a hollow tube of silver or of copper, curved, large as a swan's feather, the length of a foot and a half or thereabouts, and it is everywhere perforated. On its end it has a fresh sponge, the size of a hazel nut, firmly bound. This tube is introduced into the esophagus and drawn around, as we said before, then extracted and we can draw out a small bone or anything similar. If moreover it happens, that the lumen of the tube catches a small bone or spine, then this is withdrawn at the same time as the tube: but often the rough surface of the bone adheres to the sponge and is withdrawn from its place: which I have confirmed by experience particularly if I had the tube perforated.

Hildamus credits Walter Ryff with the discovery of this instrument and refers to the description in Ryff's "Magna Chirurgia."

Hildanus' contemporary, Johann Schultes, called Scultetus, one of the great illustrators of surgery, describes and pictures a similar instrument in his "Armentarium chirurgicum" first published in 1653 (Fig. 3). Scultetus writes:

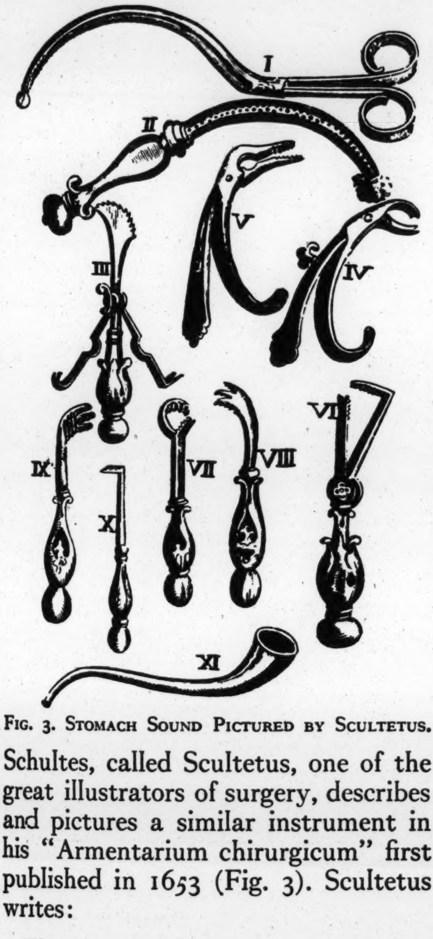

Fig. 3. Stomach Sound Pictured by Scultetus.

> The figure xi is the tube or funnel of silver which is introduced by its narrow end between the gums of the patient who has his teeth locked: through the larger end one pours bouillon or some other liquid into the esophagus.
>
> Some break with violence the teeth in front of those locked by convulsion, but because this operation is not only violent, but because it appeared cruel to our master Fabricius, he devised this more gentle method, for nourishing the patients who have convulsions of the jaws.

Both descriptions, that of Fabry and of Schultes strike one by their similarity. They also suggest that both physicians were frequently consulted by patients with fish bones sticking in their throats: an interesting commentary upon the eating habits of the time.

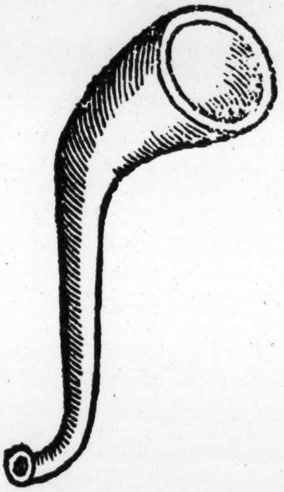

Fig. 4. Stomach Sound of Fabricius ab Aquapendente.

The use of a hollow tube to empty the stomach, to push food into the stomach and to extract foreign bodies from the esophagus, was obviously a recognized surgical procedure in the sixteenth and seventeenth centuries. It remained for Hieronymus Fabricius ab Aquapendente (1537–1619) to devise a similar instrument for the purpose of introducing food into the stomach.

Fabricius, the celebrated professor of anatomy and surgery at Padua, whose investigations upon the valves of the veins stimulated Harvey to pursue his studies on the circulation of the blood, devised an instrument for gastric feeding. This instrument is shown in Figure 4. Fabricius describes it as follows:

> How one may feed patients who have the teeth locked.
>
> There are those who give liquid food as by a funnel, putting the end of the tube in the mouth, in a place where there is a tooth missing, others have extracted a tooth or two from the mouth . . . or finally one gives them aid by a method which I invented recently; which is a tube of silver, a little curved, we make the liquid nourishment pass by the nostrils to the palate, and it is (as I think) a good method, particularly if one covers the tube with sheeps intestine [cannula agnino intestinulo].

Just as the remarks of Fabry and of Ryff indicate that fish bones sticking in the esophagus was a common surgical complication so the observations of Fabricius ab Aquapendente and of Scultetus lead one to believe that these surgeons often saw patients with locked jaws who were suffering from tetanus.

In the history of the stomach tube the next name which looms up is that of Boerhaave, the "Batavian Hippocrates." Boerhaave, discussing antidotes to poison, wrote: "When indeed men suffer from convulsions so that they swallow nothing, a flexible metallic tube should be provided, which is passed above the tongue along the membrane which surrounds the vertebrae anteriorally into the stomach and through which medicines may be injected."

Dr. Julius Friedenwald has called attention to the claims of Phillip Syng Physick as the inventor and first user of the stomach tube. He writes:

> That the credit of this discovery is due Dr. Physick there can be no doubt. Physick published his original paper October, 1812, in the *Eclectic Repertory* Vol. III Page 111 and the title of "Account of a new Mode of extracting poisoning Substances from the Stomach, By Philip S. Physick M.D. Professor of Surgery in the University of Pennsylvania."

Middleton in his charming essay "Philip Syng Physick, Father of American Surgery" states that "Physick unquestionably first used the stomach tube for the removal of poisons from the viscus and should be so credited."

Physick describes the cases of twins three months old suffering from whooping cough who had been poisoned by overdoses of laudanum. He passed a long flexible tube down their throats into the stomach and washed out their stomachs with warm water and brandy. One of the twins died but the other recovered completely. Physick observed:

> The idea of washing out the stomach with a syringe and tube, in cases where large quantities of laudanum or other poisons had been swallowed, occurred to me at least twelve years ago, and I have constantly for many years recommended it in my lectures. In the year 1809, Dr. Dorsey performed the operation of washing out the stomach in such a case but the patient had taken the poison twelve hours before he was called, so that he did not succeed.

Mathews, in an article published to establish the validity of Physick's priority, included statements from his students proving that Physick had shown them as early as 1805, a stomach tube brought by Dr. Dorsey from Paris where it had been made on Physick's order. Mathews adds:

> In the year 1803, Dr. Dorsey was in Paris, and had made, by Dr. Physick's order, a tube of the kind now generally used, constituted of the same materials as the French catheter, and resembling

it except in size. That the use for which it was designed was unknown in Paris previous to that period is evident from a letter from Dr. Dorsey to Dr. Physick, dated 1803, and now in the possession of the latter, in which he states that the makers were curious to know what was the intention of so large a catheter. It was not long before they ascertained the point, and tubes have been since regularly imported from there, for the supply of physicians in the United States.

Mathews in his article describes a "stomach exhauster" which contains two brass tubes, one of which is attacked to the stomach tube and the other to a rubber tube passing into a basin of water. By turning the circular disk at the end of the syringe, the syringe will either discharge the stomach contents into the basin, or draw up fluid from the basin and inject it into the stomach (Fig. 5).

The article of Mathews stating that Physick had demonstrated the employment of the stomach tube in the removal of poisons as early as 1805 would seem to establish Physick's priority at least over the French. However, he remarks that "it was not long before they ascertained the point" and Cadet published an article upon the subject in 1810 which antedated Physick's original paper by nearly two years.

Cadet describes a method of evacuating the stomach which he learned while attending Dupuytren's course on surgery. Dupuytren's method was to attach a long flexible sound to a large syringe, fill the syringe with warm water and then introduce the cannula into the stomach. The contents of the syringe were emptied into the stomach and then the "same water charged with poison" was withdrawn by the syringe.

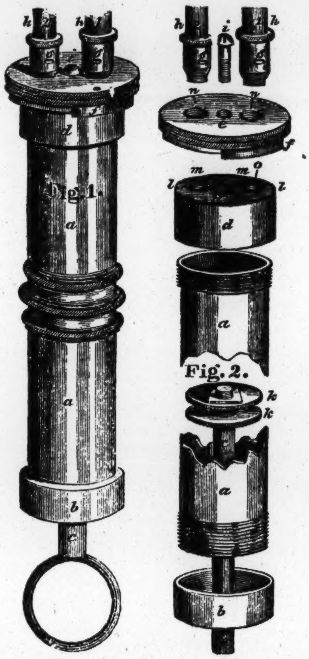

FIG. 5. STOMACH PUMP OF MATHEWS.

Orfila in his "Traité de toxicologie" says: "We should not delay in claiming the priority of this discovery for Dupuytren. We recall the description of the instrument of this professor given in February 1810 in the *Bulletin de Pharmacie*." It would have been more exact to say that since the year x of the republic, Renault and Dupuytren published results similar to the preceding (see the inaugural dissertation of Renault, year x, No. 3).

Questions of priority are always vexing and troublesome, difficult to decide with full justice to those concerned and always certain to provoke bitter controversy and even more bitter recriminations.

Dupuytren's publication obviously antedated Syng's yet the ancient physicians evacuated the stomach with their *lorum vomitorium* and Fabricius ab Aquapendente fed his patients through a hollow metal tube introduced into the esophagus or stomach. Larrey in his surgical memoirs of the Army of the Orient describes the case of a soldier who was wounded at the battle of Aboukir in March, 1808. This soldier who was shot through the throat had his epiglottis destroyed and attempts to swallow liquids were followed by convulsive coughing and vomiting. Larrey remarks that he was "most fortunately supplied with an elastic esophageal sound of gum," and by passing this sound down the esophagus was able to feed the patient. "This method, continued for a long time, saved the life of this soldier." It is noteworthy that Larrey possessed a flexible stomach tube in 1801 which seems to antedate both Physick and Dupuytren. However, the employment of a flexible tube for evacuating the stomach seems to date from the time of Physick and Dupuytren.

FIG. 6. DOMINIQUE-JEAN LARREY.

The story of the development of the stomach tube now becomes a very interesting one. It has already become a rather involved and complicated history and the subsequent events transpiring mainly in England, make the story still more involved. Anyone turning over the pages of the *Lancet* for the years 1823, 1824 and 1825 finds evidence of a raging controversy over the discovery of the stomach pumps and similar methods for removing the gastric contents.

In 1822, Edward Jukes, a surgeon of Westminister published an article in which he states that "a few days after the unfortunate decease of the late Primate of Ireland, I published a plan for removing, by mechanical agency, poison from the stomach." Jukes describes in detail his apparatus which consisted of a hollow flexible tube of elastic gum, about 25 inches in length and half an inch in diameter, which was attached to an elastic bottle. The bottle was filled with warm water, the tube introduced into the stomach and the fluid forced into the stomach and then withdrawn.

Jukes first experimented upon animals, introducing laudanum into the stomach and then withdrawing it with his apparatus. Later as his experience and courage grew, he himself swallowed 10 drachms of laudanum after which his friend Mr. Scott passed the stomach tube upon him and withdrew the fluid. The courageous Jukes became nauseated, slept profoundly for three hours but experienced no alarming effects.

The same year 1822, F. Bush, a surgeon of Frome, described his "gastric exhauster" which consisted "of a common syringe, with a flexible tube fitted to it, of length sufficient to allow one end to enter the stomach." Bush relates the case of a gentleman of sixty-five who "in a state of intoxication, which had been aided by smoking tobacco, drank an ounce and a half of tincture of opium." This patient died and the observation of this case suggested to Bush the invention of his "exhauster."

The appearance of these papers by Jukes and by Bush seems to have stimulated the inventive genius of several individuals. At Guy's Hospital on November 21, 1823, a new instrument invented by Mr. Reed, of Hosmoden Lane, Kent, was demonstrated before an interested group. A dog was given a drachm of opium and his stomach pumped with the instrument which consisted of a brass syringe to which was attached a long rubber tube. To quote the *Lancet*,

> Mr. Reed was in the theatre during the whole of the time, and superintended the use of the instrument; on quitting he received the unanimous applause of those present. Sir Astley Cooper, just after the experiment had been tried, looking at what had been removed from the stomach said that the instrument would do well for an alderman after a city feast. (*a laugh.*)

Some two weeks after the demonstration in Guy's Hospital, Thomas Alcock wrote a letter to the *Lancet* pointing out that "the comments made by the learned and able Professor, whose approbation is so warmly expressed, must be inaccurate or erroneous." Alcock points out that "the same apparatus was proposed by Boerhaave and brought to perfection by Dupuytren and Renault in France. The whole apparatus exactly as described by Mr. Jukes, may be seen in Orfila's Toxicology, vol. i, sect. 84." Alcock concluded:

> I consider comment on these facts unnecessary, and leave the profession to judge how far we are indebted to Messrs. Reed, Jukes, Bush & for this improvement in the treatment of persons who have taken poison; or to our continental brethren, whose views on this subject have for so long a period been made known to the world.

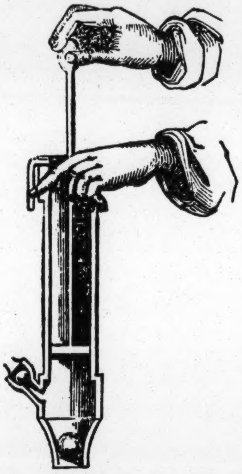

FIG. 7. REED'S STOMACH PUMP.

Reed in 1825 sent a letter to the *Lancet* asserting anew the importance of his discovery and the superiority of his instrument. He illustrates his letter with a sketch of the instrument (Fig. 7) and refers to instruments made by Weiss and others. He adds: is it "not an absolute absurdity, as well as falsehood, to speak of these instruments as 'improvements' upon mine?" Weiss soon answers Reed and refers to "that confident and boastful tone which but ill conceals the anger of a disappointed man," and condemns this "rash and violent effort to sustain the sinking reputation of his Valve Syringe." Some years later we learn from Jukes' book on "Indigestion and Costiveness," that its author invented the stomach-pump. Jukes describes his apparatus in some detail

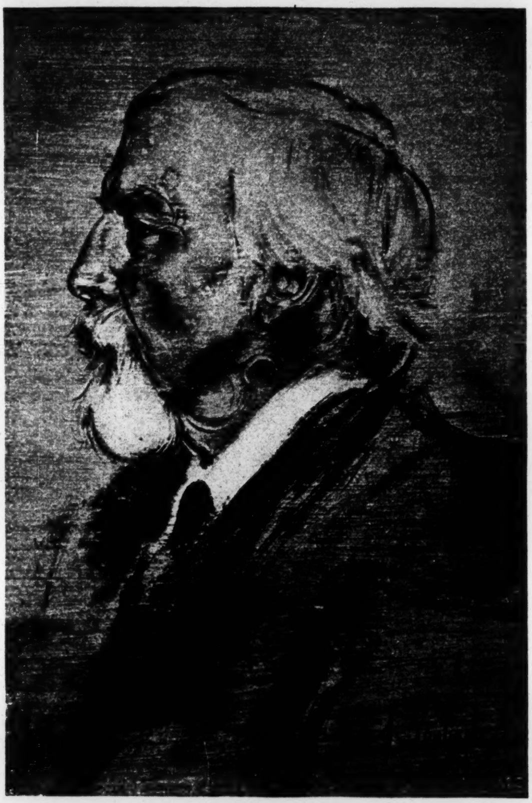

Fig. 8. Adolf Kussmaul.

and does not bother himself at all with questions of priority nor is there any hint of any previous investigations or controversy upon the subject.

Adolf Kussmaul then obviously did not discover the stomach tube or the stomach pump, nor does he make any such claims. He tells us quite clearly that his stomach pump was designed by a Dr. Wyman in America and that he became acquainted with it by reading an article of Bowditch in the *American Journal of Medical Sciences.* He did, however, obtain some remarkable results in treating dilatation of the stomach with the stomach pump. The fame of the instrument travelled far and wide and the stomach pump soon became quite as much a part of the doctor's armamentarium as his stethoscope or fever thermometer.

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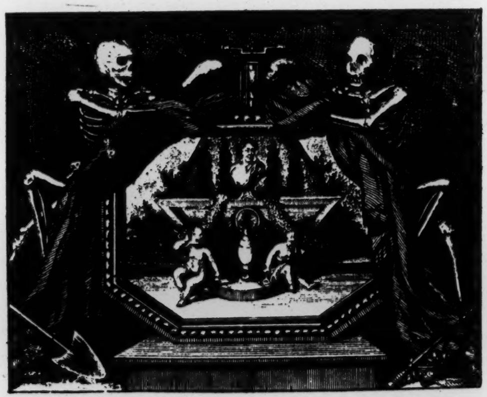

[From Cowper: Anatomia Corporum Humanorum Utrecht, 1750.]

REJUVENATIONS AND SATYRICONS OF YESTERDAY

By PAN. S. CODELLAS, M.D.

SAN FRANCISCO

Whence and Whither?

WHEN the grey matter in the human cortex began to develop and establish sensation, perception, emotions, instinctive, purposeful or rational reactions towards a desired objective, association, memory, general intelligence, judgment, then man began to realize environment and attempt to control it. The early man in his later intellectual infancy probably was imbued with the curiosity to answer the question of the origin of his earthly appearance and disappearance, of Life and Death.

To primitive intellect human initium and exitus were not two opposing ends as they are to maturing more advanced mind.

The earliest men thought of life as a natural, normal condition, because they realized by it in the male an increase of man-power and in the female an added productivity of the tribe, while death was considered as an abnormal, terrible misfortune. Therefore death early and gradually began to assume a more vital and greater importance.

Man's short route of beliefs and explanations responded promptly to his surrounding natural phenomena.

The Golden Race

The poet sings that there was a time when man enjoyed a blissful, eternal juvenility, free of uncertainty, care, disease and disability.

During the reign of Cronos then lived the Golden Race of men, free from ills, and hard labour and exhausting diseases, which the Fates give to men; they lived like Gods with a soul not touched by sorrow, far away from labour and grief; there was no miserable senility; for always the arms and legs were strong and indefatigable, enjoying merry feasts beyond the reach of all evils. They died as if they were subdued into sleep." [Hesiod's "Works and Days," 90 seq.]

Imposition of Death

Death was the subject of numerous speculations as to its origin. Among the earliest primitive theories we find it commonly thought to be a trick. At a later period it appears to be due to the malevolence of demons craving human flesh and for this inflicting death to men. To some death was the separation of the soul from the body, which was the result of sorcery. In higher, yet barbarian mentality, it was imposed as punishment upon mankind as the penalty for some transgression, for the sin of some fellow being that disobeyed the tenets of a god or gods, or from the stupidity, overzealous curiosity or envy of some lower animal.[11]

The tradition of ancient peoples, primitives in the past and present, the Old Testament, and folk lore supply ample examples of the cause for which death was engrafted upon mankind.[1]

To appease the imposed catastrophe of death, to which even the gods, at least of Egypt, are subject, primitive thought instituted the paregoric conception of continued life after the corporeal dissolution.

LONGEVITY

The development and retrogression of the human body and its concomitant usefulness must have been noted.

In prehistoric and ancient times there must have been individuals of unusually long life, to whom tradition naturally added more years as it handed their stories down to posterity, although we have no written records of them.

Thus another life problem faced the emerging human mind, which had to be accommodated as well, Old Age and Longevity.

This founded the feasibility of attaining a prolongation of the allotted number of years. Once longevity became a yearning with an established basis for support, human ingenuity with unbridled imagination willingly encountered the task of adding more years to an individual's life with expected surety of success.

The Old Testament gives long ages among which may be mentioned Noah's of 150 years, Abraham's 175, Isaac's 180 and Jacob's 147 years.

To the Greeks and Romans longevity was not unknown. Onisicritus states that some Greeks, even whole families, stayed youthful for centuries; one named Papalius reached the age of 500 years.[6]

Strabo relates that in Punjab some people live to be more than 200 years old.[6]

Lucian's "Longaevi," addressed to Quintillus, is an exposition of a detailed study of longevity, an excellent treatise on the subject with a very systematic and thoroughly methodical digestion of the data. He divides his material according to professions and occupations, among which he includes emperors, generals, philosophers, historians, rhetoricians. He gives another classification by nationality or race, wherein he mentions Scythians, Romans, Illyrians, Egyptains, Arabians, Brachmans, Persians, Parthians, Bactrians, Arians, Chrosmanians, Saces, and Medes.

It is reported that the seer Tiresias lived to be six generations old.

The most noteworthy is the people of Seres in India, who reach an age of more than 300 years. Lucian gives as cause of this long life, plain, simple and rather scanty diet. For the Seres it is thought by some to be due to the air, by others to telluric influences or to diet or any two of these. The people of the nation of Seres are reported as drinking water all their lives.[5]

The Roman statistics that cover the times of Vespesian show that six individuals were 150 years old or more when they died.[8] Pliny mentions an Illyrian of 500 years, also a Cyprian king more than 160 years of age. Litorius of Aetolia is said to have attained the age of 200 years. Among the surviving literature we find several cases of even multicentenarians. In the rather recent writings also very advanced old ages are reported, some of which appear authentic.

The following is taken from the works of Dr. William Harvey and is given almost in full, as being, I believe the one case of such prolonged age with an autopsy:

> The anatomical examination of the body of Thomas Parr, who died at the age of one hundred and fifty-two years; made by William Harvey, others of the king's physicians being present, on the 16th of November, the anniversary of the birth-day of her serene highness Henrietta Maria, Queen of Great Britain, France, and Ireland.
>
> Thomas Parr, born near Winnington in the county of Salop, died November 14th

1635, lived 152 years, nine months, was presented to his majesty the King, by the Earl of Arundel, made an examination of the body of this aged individual by command of his Majesty, . . .

His body was muscular, chest hairy, . . . The organs of generation were healthy, the penis neither retracted nor extenuated, nor the scrotum filled with any serous infiltration, as happens so commonly among the decrepid; the testes, too were sound and large; so that it seemed not improbable that the common report was true, viz., that he did public penance under a conviction for incontinence, after he had passed his hundred years; and his wife, whom he had married as a widow in his hundred-and-twentieth year did not deny that he had intercourse with her after the manner of other husbands with their wives, nor until twelve years back had he ceased to embrace her frequently. The cartilages of the ribs were not found harder or converted into bone in any greater degree than they are in ordinary man; on the contrary they were soft and flexible. The cause of death seemed fairly referrible to a sudden change in the non-naturals, the chief being connected with the change of air, . . . And then for one hitherto used to live on food unvaried in kind, and very simple in its nature, to be set at a table loaded with variety of viands, tempted not only to eat more than wont, but to partake of strong drink, it must needs fall out of the functions of all the natural organs would become deranged . . . no wonder that the soul, little content with such a prison, took its flight.[4]

Long life is often the object of charms. Most religions have prayers for long life. The greater number of good wishes of man to man are for an increase in the number of years of life.

Attitude towards Old Age

Excluding the collective feeling and behavior of clans, tribes or of later socially organized groupings, we may say that there is no agreeing disposition towards senescence, it depends upon the individual, facing the afternoon of life and nearing the setting down, and his aspects, vanities, experience and philosophy.

Generally the Greeks had a gloomy stare at old age and a pessimistic tendency. Aphrodite, addressing Odysseus, represents the Olympian view on old age, "Age that is pitiless, and ruinous, and weary, and weak, and that cometh on old men, and that is hateful to the gods."

Hesiod calls age destructive and conceives it as "the offspring of Black Night" ("Theogony," 224, 225). To him the cause of old age is the modern complicated mode of living and its hardships, "for in misery men grow old" ("Works and Days," 109).

Age is personified as a Ker, a Fate, an unavoidable condition. The appended illustration depicts Herakles in the act of dealing a deadly blow on the head of Geras, or Old Age, as the figure with the cane is inscribed, thus settling its identity.[3]

Theognis, the Megarian,[2] sheds tears, "I weep the exhausting old age"; "the destructive and ugly old age overhangs our heads." He prays to Zeus: "Keep far away from me the evil Keres, defend me from wasting Old Age and the end of Death" (1015, 1128). To Archilochus, the Parian,[2] "the highway of old age is killing" (lxv). Simonides, the Coan,[2] thinks of "old age as unenviable" (ccxxxi). Mimnermus, the Colophonian,[2] lends his lyricism to a dirge, "what is life without the Joyful Aphrodite? I wish to die when I cannot care of these any longer"; "We blossom like the leaves that come in the spring, . . . but always at the goal stand black Keres, one holding in her hand grievous Old Age, and the other Death" (ii, 5–10). He prays to die at sixty free of disease and sorrow. He calls old age painful, exhausting (i: 1, 5, 6, 10). "To Tithonos Zeus gave endless old age, which is colder shivering than death" (iv). Solon, the Athenian and one of the seven Wise Men,[2] simply denotes old age ugly (xii, 10).

The Greeks of classic and later times may be taken as representing the consensus of the feelings of humanity; they all give us a well-nigh concordant opinion, except Plato, whose portrayal of the aged is a self-composed, philosophical, satisfied turning into the downwards arm of the curve of life, facing closer and closer the terma, free now of the temptations, emotions, ambitions, enthusiasm, desires and dreams of youth and manhood; this delineates the preserved senility especially in body and its concomitant infirmities without the mental deterioration. This statement may be due to the planning of the Ideal State, for it is found in the "Republic" (329A) and cannot be accepted as representing his candid personal attitude, while all the rest differ. Sophocles in one place at least agrees with Plato, yet in another with a choleric tone tints this station in life's journey: "and then at last age possess him, age abhorred, infirm, unsociable, friendless, that misery of misery may be a room-mate" (Oed. Col., 1230 sqq.).

Aeschylus draws with bold strokes "the over loaded in years old age now as a dried, lifeless leafage goes over the Three-Foot-Uphill-Journey, not even having the strength of a child for the service of Ares, a dream to open eyes during mid-day, a feeble shadowy living" ("Agamemnon," 79 seq.).

Euripides spits his venom with hate and a curse: "I hate the horrible murdering age; be it drowned by the waves of the storm!" (Herakles Fur., 637 seq.). Pindar in almost the same chord invests his verses (Nem. vii, 5). Strabo, representing the sentiment of a later period, shows no change in the disposition of the Greeks referring to old age (p. 486).

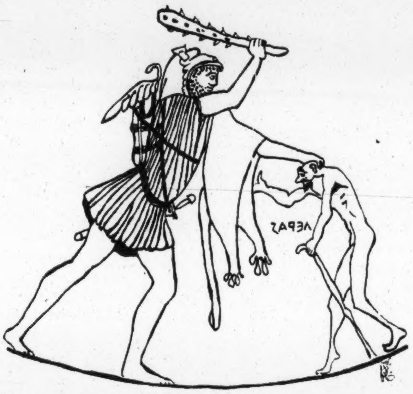

FIG. 1. HERCULES SLAYING OLD AGE, GERAS. (AFTER HARRISON.)

Aristotle paints Old Age with horror for it destroys beauty and vigor and mars enjoyment, and couples Death with it as the "two inevitable demons." The deep and clear thinker of Stagira gives us his ideal of good old age: it must be free of ill-health, come on slowly, be free of pains, have enough strength, naturally adopted to carry on labors, without annoying others, free of disagreeableness ("Rhetorica," II: xii, 13, 1; v. 15; ii, 13).

This pictures the art of becoming and being a good old man, but the "Spartans knew best how to get old" (Plutarch).

Nevertheless Old Age generally is garbed with honor and respect, being the palpable link of the ancestors, upon whom the whole structure of national life, religion, institutions and civilization is founded. Such duty-bound exemplar citizens are the Spartans.

The fear to face the inevitable, and a desire to escape the ugliness and weakness, that man might die at least in advanced good old age with comparative vigor, was devoutly to be wished.

Calypso to extract a promise from Odysseus that he stay with her, offered him youthful long life (Od. v, 515).

EVOLUTION OF ORGANOTHERAPY

The first gross difference that can be observed in a dead body compared to a living one is absence of motion, cessation of all functions and sensibility.

To erect a conception of life and death from this basis was beyond the primitive mentality.

In early thought life was confused with the soul and other "life" principles. Finally the idea of life was conceived and reared in magic. The magical ideation became the chief governing force of social and religious activities. Nutrition and its elementary principles, adopting magic, became an extensive vitalism. To begin it was an effort to secure life. Upon this was built a vast amount of superstition about food into which magical and later vitalistic theories were introduced.

Cannibalism was natural to man in his early dawn. Anthropophagy probably antedates Neolithic and even Palaeolithic man.

Established and conscious kinship limited the field of man-eating custom, in a similar manner as the tabu of endogamy was enforced. The totem of the tribe, be it a plant or animal, was among the tabus. Laws were instituted accordingly, to ban their use as foodstuffs. Porphyry says that the Egyptians and Phoenicians had rather eat human flesh than that of the cow (de Abst., ii, 11). Generally cannibals eat the enemies for revenge and the relatives for ritual purposes.

There are as many varieties of anthropophagy as motives: for acquiring qualities, strength or the soul of the victim, for magical reasons, out of affection, for hatred, through gluttony, for religious, ritualistic, political or social purposes. Certain animals were eaten for their outstanding qualities absent in man. Valor, strength, audacity, ferocity, swiftness, cunning, keenness of senses, fearlessness, long life were much sought for by early man, that he might be successful in the struggles of life.

Probably this was the outcome of the established fact of the sustaining power of food. Therefore the conclusion was jumped upon, that by eating the flesh of a beast or a man, his qualities would be assimilated and incorporated into the eater's body. This was fortified by the magical theory of the part being equal to the whole and able to substitute and supply the qualities of the entire object. The development of Animism aided this theory of appropriation of virtues by eating the flesh of the owner. In many cases part of the flesh or organ was consumed, the heart, liver, eyes, tongue, cheeks, lungs, marrow, or the blood was drunk, according to the prevailing belief of which organ was the seat of the soul or of the looked-for quality. Chippewa women fed their children with the blood and pieces of the flesh of English prisoners to make warriors of them. Cannibalism of this sort only requires a part of the body or organ; it is not a complete meal.[11]

Upon these ideas we may easily understand the introduction and foundation of medical cannibalism, wherein it is believed that the flesh or part of the dead body can impart into the partaker's frame strength and the power to combat and alleviate or cure diseases.

Thus the pharmacopoeias were enriched by including among the official preparations and ingredients parts of a corpse. To each particular part was assigned a special pharmacological virtue. Pliny cites a number of medical concoctions whose main ingredients were parts of the human body (N. H., xxviii, 1).

Horace gives an instance of what may be called magical cannibalism, when he mentions that love-philters were compounded from dried human marrow and liver (Od., V: v).

The Zulus to obtain long life eat the flesh of animals known to be long-lived.* Medea, rejuvenating Aeson, throws long-lived deer and crow into the seething cauldron containing the restorer of youth. The Olympian Gods owe their immortality to their diet of ambrosia and nectar.

THE QUEST OF ELIXIRS AND FOUNTAINS OF YOUTH

If deathless life on earth was denied to man and his efforts to be reinstated in immortality were of no use, then the second best choice was to attain long, youthful life.

The primitive and unscientific mind knows no obstacles or limitations, and having the omnipotent Magic at hand employs it to stay the decaying of human frame, restore the waned stage and sustain the plateau of vitality, friskiness, beauty, vivacity, delightfulness and youthfulness.

The testicles play a prominent role by sympathetic influence.

Medicine-men, Shams, Lamaistic priests, Parsee and Mohamedan faquirs and hakims esteem the use of male generative organs very highly as nerve tonics and stimulants, and use them exclusively. The Chinese stores in San Francisco display at their show-windows the testicles of sea-lions, which are used medicinally. The Chinese physicians use them extensively. I am told by a Chinese pharmacist, trained in our materia medica, that their greatest use is as a tonic, especially during the menopause.

The Indians of the Northwest, of the Rocky Mountains and the Plains employ them in the form of a powder prepared from dried-up testes. The older Indians encourage the eating of raw buffalo and antelope testes. They claim that they increase power in every respect and especially in sexual vigor and bravery.[9]

GREEK MYTHOLOGY, MEDEA

There are extant examples in Semitic, Baylonian and Oriental literature, where the male organs or their products are taken internally for increase of vitality and general tonicity.

In Greek mythology is preserved the most perfect instance of rejuvenation that human heart craves for, in which Medea with a miraculous master hand restores life and youth to plants, trees, animals and finally man. What a comparative scale, similar to our experimental field of today!

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*Callaway, H. Nursery Tales of the Zulus. London, 1868, p. 175.

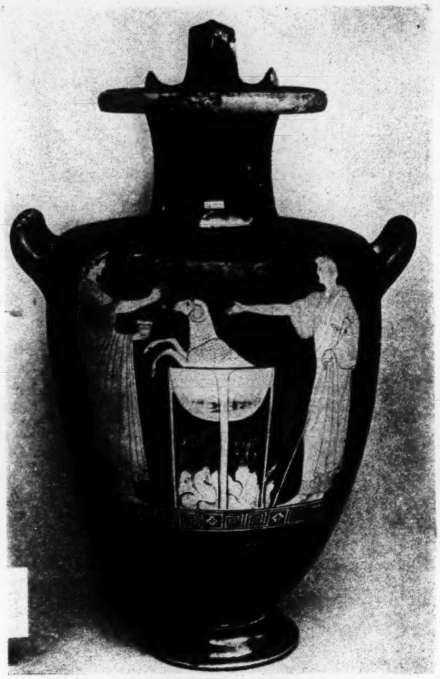

Fig. 2. Medea Rejuvenating the Ram. Courtesy of the Director of the British Museum.

Aeson's Rejuvenation

The Argo triumphant appeared on the horizon and leisurely nosed into the Pagasean Gulf, to proceed for the home-port of Iolkos. She was safely bringing back the Argonauts with a double prize, instead of a simple one for which she had gone forth; besides the Golden Fleece, Medea was aboard, as the bride of the successful and adventurous captain Jason.

In the city of Iolkos the citizens, the friends, relatives, mothers and fathers of the audacious sailors were preparing a gala festival during which thanks would be offered to the Gods; huge altars were erected and heaps of incense were burning, the victim to be offered to the Gods awaited with gilded horns.

But the most proud of all fathers lay in bed with very advanced old age, near death. Aeson, the father of Jason, could not leave his house to witness the reception of his son and his bride. The enthusiasm of the populace did not much move the heart of Jason while his aged father was abed. Jason's feelings overflowed as he looked at the condition of his father. After all the help he had received from Medea he believed that she was the only person to satisfy his inner wish, of cutting off some of his own years and adding them to his father's, that the latter might live longer. Almost with tears in his eyes he entreated Medea; "Mighty wonder worker, I believe that you can take a portion of years of my life and add them to my father's." "Your words are impious," said Medea, "even Hekate herself cannot do this; yet I will give a greater gift. By my art I will try to renew the long life with the aid of the three-faced Goddess and her grant."

By the full moon at night, with only a few bright stars twinkling above her, Medea invoked Mother Earth, Hekate, Black Night; kneeling she prayed fervidly: "The task now at hand is to find juices, by whose aid the old man will be renewed and return to the flower of his early youthful years."

Her car, drawn by winged dragons, drove over the Tempe, Ossa, Pelion, Othrys, Pindus, Olympus surveying what root would serve her purpose, also many grasses from the banks of Apidamus, Amphrysus, Enipeus, Spercheius, Peneus and the banks of Boebe, Euboean Anthedon, and the grass that gave long life, not yet famous by the change produced in Glaucus' body. For nine days and nine nights she wandered, picking the choicest ingredients. The dragons from the odor of the herbs sloughed off their skins of many years.

She returned with a valuable cargo. She built of turf two altars, one on the right to Hekate and one on the left to Youth, and hard by she dug two ditches in the earth and performed her rites; with blood of black ram she drenched them. Next she poured upon them tall bronze bowls of wine, and bowls of warm milk, while she uttered her incantations, calling upon the deities of the earth, and prayed the King of shades not to be in haste to rob the old man's body of the breath of life.

After she had appeased all these divinities in low-voiced prayers, she bade her people bring old Aeson's body out into the open air; having melted him down into complete sleep by her verses of incantations, she layed him in a bed of herbs breathless like a dead body. She then bade Jason and all the attendants retire to a far distance.

Now Medea with her flowing hair as the Bacchantes moved around the flaming altars; she dipped multi-branched torches in the dark pools of blood, she lit the gory sticks at the flames of the altars. Thrice she purified the old man with fire, thrice with water, thrice with sulphur.

In the meantime the powerful medicament in the pot of bronze boiled and bubbled with white frothy top. Here she boiled the roots gathered in Thessaly, with seeds, flowers and strong juices; to these she added pebbles from the farthest Orient and sand, which the deep Ocean laves with the ebbing tide; she further added hoar frost gathered under the full moon at night, wings and flesh of the infamous horned owl and the entrails of werewolf, which had the power of changing its wild beast features into a man's. Also she deposited in the pot the scaly skin of the slender Cynyphian water-snake, the liver of a long-lived stag, to these she added the head of a crow nine centuries old and a thousand other things.

She stirred the pot with a fruitful branch of olive which had been dry for a long time; she stirred up and down and from side to side.

And lo, the dry old stick when moved about in the hot broth grew green at first; shortly leaves appeared, and then suddenly it was loaded with teeming olives.

And wherever the froth bubbled over from the hollow pot, the earth grew green and flowers and soft grass sprang up. When Medea saw this, she unsheathed her knife and cut the old man's throat, then, letting the old blood all run out, she filled his veins with her concoction. When Aeson had drunk this in part through his lips and part through the wound, his beard and hair lost their hoary grey and quickly became black again; his leanness vanished, away went the pallor and the indifferent look, the deep wrinkles were filled with new flesh, his limbs had the strength of youth. Aeson was filled with wonder, and he remembered this was as he had been forty years ago.

Bacchus had witnessed this marvel from the sky and learning from this that his own nurses might be restored to their youthful years, he obtained this favor from the Colchian woman. (The foregoing account is freely adapted from reference 7.)

MEDEA'S REJUVENATION BETRAYS PELIAS TO DEATH

Medea feigned a quarrel with her husband, and fled as a suppliant to the house of Pelias. There, since the king himself was heavy with years, his daughters gave her hospitable reception. These girls the crafty Colchian in a short time won over by a false show of friendliness. Medea related the rejuvenation of Aeson, and by her dwelling particularly on that the daughters of Pelias were induced to hope that by her skill their own father might be made young. And they begged this boon. She made no reply for a little while and seemed to hesitate, keeping the minds of her suppliants in suspense by feigned deep meditation. When she had at length given her promise, she said to them, "That thou may have greater confidence in this boon, the oldest leader of the flock among your sheep shall become a lamb again by my drugs." Straightway a woolly ram, worn out with untold years, was brought forward, his great horns curving round his hollow temples. When Medea cut his scrawny throat with her Thessalian knife, barely staining the weapon with his scanty blood, she plunged his carcass into a kettle of bronze, throwing in at the same time juices of great potency. These made his body shrink, burnt away his horns, and with his horns his years. And now a thin bleating was heard from within the pot; and, even while they were wondering at the sound, out jumped a lamb and ran away to find some udder to give him milk.

But the promised rejuvenation of Pelias by treachery resulted in his death.[7]

EDWIN SMITH PAPYRUS

The Edwin Smith papyrus supplies us with the oldest prescriptions in the "Book for transforming an old man into a youth of twenty." The echo of this is met with in the leaflet of a quack of London in 1680, which claims the virtues of his "Great Restorer, that it has the miraculous operation that renders old men and women by three or four scores as youthful as those of twenty or thirty years of age."

The Egyptian document recommends a preparation for external use to banish traces of age from the face; it is a facial paste, and is kept in precious or semiprecious vases or flasks. It is written by two different hands. The directions for preparing it are given: Hemayet-fruit, @ 2 khar, bruise, place in sun; when dry, husk, winnow, till the fruit remains. Measure, sift, measure, divide into two parts. Two processes are followed:

(1) Water to soft mass, cook, boil, evaporate, wash, spread on linen, dry grind; (2) water to soft mass, in jar, cook, boil; clay consistency, thick, on linen, put in vase. Directions (xxii, 7–10): Anoint. It is a remover of (wrinkles) from the head. When the flesh is smeared therewith, it becomes a beautifier of the skin, a remover of (blemishes) of all (disfigurements) of all sign of age, of all (weakness) which are in the flesh.

Found effective in myriads of cases (xxi, 9; xxii, 10).

The contents of this papyrus probably have been drawn from sources reaching as far back as 3000 B.C. or more.[12]

THE SATYRICON OF GREEKS AND ROMANS

Satyricon is a male gland preparation which during the classic times of Greece gained a great reputation as an aphrodisiac and general stimulant. In Rome at the time of the Empire the same composition made of the testes of goat and wolf enjoyed esteem of being an upbuilder of strength and supporter of life, having as a result the delay of fatigue and exhaustion. It was extensively employed in all nervous disorders, as well as for the exhaustion from sexual excess. This and similar preparations known under the name *aquae amatrices* are of similar composition, and were peddled on the streets of Rome and in the public markets of the time. It also had a prominent part in the make up of witches' potions, which were lavishly indulged in by the elite Roman youth to replenish wasted vitality and inducing satyriasis. This bears to its credit the suicides of Lucretius, the author of "de Rerum Naturae," and Lucullus "The Epicurian"; further it is accredited with enabling Caligula and Nero to sustain their prolonged sensual debauches. These potions were the basis of the daily regimen of the notorious Messalina, the wife of Emperor Claudius, and she also administered them to her legion of lovers, that she might increase their orgies.[9]

PARACELSUS

The medieval alchemists were led to include with their search for the philosopher's stone the quest for the elixir of life. Alchemical writings are full of references to such an elixir.

Philippus Aureolus Theophrastus von Hohenheim, usually called Paracelsus (1493–1541), made extensive use of the sources of the Saracenic schools, which enabled him to compound his elixirs and other preparations whose main ingredient was the secretions of the sex organs of man and mammals. Salmon's "Dispensatory" (London, 1684) gives: "Sperma hominis, semen, sperm. Of this Paracelsus makes his homunculus. Experience has proved it good against the imbecility of the instruments of generation."

MESUE'S DIASATYRICON

In "Summula Jacobi de partibus per Alphabetum super plurimis remediis ix ipsius Mesue libris exerptis" (1540): "Sperma multiplicant confectis testiculorum vulpes, oleum amygdalorum dulcium, oleum de nuce Indica, oleum de granis sisamis. oleum de semine line.[1] The Diasatyricon is more fully prescribed in the "Cordic Dispensatory" of 1546. It is compounded from a long list of ingredients, of vegetable oils, roots, sweet butter, ginger, bird's tongue, pepper, cinnamon, and others among which are testes of wolf (testiculorum vulpis unc. viii).

BARICELLI, BLAZE

In "Hortulis Genialis, Julii Caesarius Baricelli, a sancto Maris doctoris medici, Genoa," is found a prescription for sexual rejuvenescence, of which the main ingredient is the testis of wild boar.

A similar prescription is in a work by Elzear Blaze (1740): "If you be advanced in years, these glands (testicles of the wild boar) dried and reduced to powder, stirred into broth made from a virile cock, taken by man and wife when failing, will insure virility and love of lust returned."

THE LONDON PHARMACOPOEIA OF 1676

During the seventeenth century the products of reproductive organs as obtained from mammals, birds, and fishes were still in vogue and had great reputation as a sort of panacea for several ailments among which we may note epilepsy, chorea and neurasthenia. Their chief use, however, was as restorers and maintainers of sexual potency. Their repute was so great that they found their way into the London Pharmacopoeia edited by the Fellows of the Royal College of Physicians in 1676; also into the Dispensatory of Salmon of 1684. From these we may extract the following:

> Aper, the boar, . . . the stones and pizzle dried, and given in powder ʒi at a time, help weakness and barenness. Canis, the dog, . . . the testicles and secretion provoke lust. Cervus, the deer, . . . dried and drank in wine provoke lust. Equs, the horse, . . . excite venery and expel the afterbirth. Panthera, Leopardus, panther or leopard, . . . the testicle being drunk by a woman provokes the terms. Taxus, the badger, . . . eaten with honey, stirs up lust and causes conception. Aquila, the eagle, . . . the testicles cause venery. Buteo, the buzzard, the testicles help the weakness of generation. Gallus, the cock, . . . the testicles stir up lust. Sturio, the sturgeon, . . . their spawn increases seed and provokes lust.

Later difficulty of procuring these items, the unsuitability of the preparations and the long unsupported claims caused the gradual elimination of all such materia from the Pharmacopoeia.

Reproductive organ products have been also used to excite virility and increase mounts in domestic animals.

MODERN TIMES

The rejuvenation wave that was initiated by the work of Brown-Sequard in 1889 and swept the whole medical world for a while at least finally went the same way as the foregoing.

The very recent reripplling of the same subject had its usual fancy captivation, without any definite results.

Concerning the rejuvenescence elixirs we stand just where our predecessors were thousands of years ago.

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AESCULAPIUS AMONG THE AUGUSTANS

By MINNA LEWINSON

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APOLLO and Aesculapius have always been allies in England. From the time of Thomas Lodge, one of the most exquisite of the Elizabethan lyricists, to our contemporary Francis Brett Young, there have been medical men who have won equal (often greater!) renown as men of letters. But they have been sporadic, perhaps one in a generation. Never before, and never since, that brilliant period in our literary history which we call the Augustan Age, the first quarter of the eighteenth century, has there been the spectacle of six physicians, all of them actively practicing, and several distinguishing themselves thereby, simultaneously contributing to the letters of their day, and winning not only contemporary fame, but definite places on the roster of English literary men.

It is difficult to assign reasons for this sudden outflowering of literary talent among the medical men of the time. The most obvious, and probably the most cogent, was the tremendous widening of interest in all forms of literary production, which took it out of the narrow court circle where Dryden's age had confined it, and put it into the hands of politicians, like Addison; of social reformers, like Steele; of churchmen, like Swift; and turned it into a means of livelihood which made possible, for the first time, professional literary men, like Defoe. Naturally in this democratization of letters, which took in every class and every group, either as creator or audience, physicians played an active part. Perhaps Fate just set down at that moment this group of medical men with the faculty of articulating their reflections upon the world; perhaps their creative ability was itself created by the consciousness of a large ready-made audience eager for new ideas affecting its life. Whatever the cause, the fact remains that from 1695, when Sir Richard Blackmore published the first of his incredibly numerous and prolix literary works, until 1746, when the precocious muse of Mark Akenside expired, with one last gracious smile, a constant stream of poems, satires, essays and sketches from the pen of physicians swelled the tide of English literature.

Of these most have now only a historic interest; but at least two, possibly three, have become classics, and several others stand close behind. No serious student of English literature passes by Garth's "Dispensary" or Mandeville's "Fable of the Bees," or reads them without either pleasure or profit, and Akenside's "Pleasures of the Imagination" is even today far from dead. Millions have adopted the phrase "John Bull" as a symbol for Great Britain, even though few of those who use it so glibly know that it originated in a satirical pamphlet written by an eighteenth century physician, Dr. John Arbuthnot. Only one of the half dozen physicians who were such a fruitful part of the literary life of the Augustan Age produced nothing which lived beyond his own lifetime, and curiously enough, it is he who produced most of all. Perhaps there is something in the old adage that quality and quantity are incompatible.

What today we call "social contacts" was of primary importance in the literary life of the Augustan Age. A man's friends were often the sources of his ideas, usually the cause of his political or professional preferment, and the index of his success. If he was welcome in court circles, if he could hold his own among the wits, if he belonged to the Kitcat or the Brothers' Club, he was one of the elite, a success in the eyes of his contemporaries, whether time has upheld this judgment or not. In Augustan eyes, Arbuthnot, Garth, Blackmore, all of whom held court appointments, and John Armstrong, who was a friend of Thomson, Young, Lord Lyttleton and the famous parliamentarian, John Wilkes, were surrounded by a gilded aura; they were an integral part of the brilliant life of the day, particularly Arbuthnot, whose circle of devoted friends ranged from Pope and Swift to Addison and Lady Mary Wortley Montagu, from Harley and Bolingbroke in the field of politics to Handel the musician. Mark Akenside wrested admiration from his age by virtue of his phenomenal intellectual achievements. Mandeville alone, the most powerful mind, the most penetrating genius of the six, remained an outsider, in fact, an outcast, frowned on by polite society, arraigned as a "public nuisance" by the press and bitterly attacked by his fellow-writers.

It is not quite accurate to say that this golden age of Aesculapius in English letters was coincident with the Age of Anne. When Sir Richard Blackmore published his first epic poem, "Prince Arthur," in 1695, William of Orange was on the throne; when Akenside produced his last poem with any claim to distinction, the "Hymn to the Naiads," in 1746, George II was reigning; and Armstrong, the last of the group to die, wrote his last volumes of sketches under the aegis of George III. The greater part of their work, however, was done in the first quarter of the eighteenth century, those golden years during which Pope, Swift, Steele, Addison, Defoe, Gay, Prior and a host of others were pouring out the best that was in them and winning fame for themselves and their generation.

As a physician Sir Richard Blackmore achieved no small measure of success; as a literary man he was viewed with either contempt or indignation in his own day, and has been treated with supreme indifference ever since. Few men have written as prolifically as he, and few as dully. He wrote with equal nonchalance on historical, philosophical, religious and medical subjects, and despite an immensely busy practice, turned out epic after epic, of from six to twelve books each, continuing his literary labors to the very end of his life, and leaving behind him such a monument of works that Swift was moved to catalogue them in an exquisitely amusing rhymed list. He admitted that he used to compose his poems during hours spent in coffee houses and passing up and down the streets of London. Perhaps one should not be surprised that they are not more poetical. Were it not for the jibes of his contemporaries at his tediousness, and for his attack on the licentiousness of the wits of the day, which roused them all to rally against him, his name might not have come down to us at all.

The son of an attorney-at-law, Blackmore was born somewhere between 1650 and 1655—the date has never been established to a certainty—and was educated at the Westminster School and at Oxford. After receiving his Master of Arts there in 1676, he was forced by necessity to teach for a while before continuing his studies, a fact with which his fellow-writers constantly taunted him in later years. One of them slily remarked, "His boys grew blockheads, and his patients died." However, Blackmore was not deterred from fulfilling his ambition; he went abroad, won his degree in medicine at Padua, and in 1687, having returned to London, was admitted as a fellow of the Royal College of Physicians. In 1716 he became a censor of the institution, and later the same year an elect. Meantime other honors had come to him. Presumably as a reward for a part played in the revolution of 1688, he was appointed physician in ordinary to King William, and knighted. When Anne ascended the throne he became one of the physicians attached to her person.

First in the long procession of Blackmore's weighty productions was "Prince Arthur, an Heroick Poem in x Books," which, despite the admiration of the philosopher John Locke and the carping criticism of Dennis, was soon forgotten. Next came a "Short History of the Last Parliament"; and then, in 1700, the pamphlet which made him one of the best-hated figures of his time, a "Satyr against Wit." Up to this time Blackmore had had neither friends nor enemies among the literary men, his friends being of the court and the City. Now he had enemies, plenty of them. Dryden castigated him in the "Preface to the Fables"; Garth, a fellow-physician, in "The Dispensary"; Steele, Sedley and others joined the chorus. A satirical reply appeared entitled "Commendatory Verses on the Author of the Two Arthurs and the Satyr against Wit, by some of his particular friends," the chief contributor being that Tom Brown who has become immortalized as the author of the famous verse, "I do not love thee, Dr. Fell."

Undaunted, Blackmore continued to fill his scant leisure with writing. In 1705 came "Eliza, an Epick Poem in x Books," which was received, and has continued to be received, with complete indifference. Next, a philosophic poem in three books, "The Nature of Man," followed by another, "Creation," which Addison, Dennis, and later Dr. Johnson found worthy of praise, though it has not survived. In a volume of "Essays on Several Subjects," Blackmore was unfortunate enough, or foolish enough, to provoke the anger of Pope by an allusion, and in consequence he found himself cavorting among the dunces in the "Dunciad," the usual punishment which the most brilliant, but worst-tempered wit of his day meted out to those who incurred his displeasure.

Blackmore wrote two more long epics, "Redemption," in six books, and "Alfred" in twelve, besides a treatise on Natural Theology and two religious controversial works, "Just Prejudices against the Arian Hypothesis," and "Modern Arians Unmasked." More than most of his medico-literary contemporaries he wrote on medical subjects, though not always soundly; he is known to have strongly opposed vaccination for smallpox. His medical writings include: "A Discourse on the

Plague," "Treatise on the Small Pox," "Treatise on Consumptions, etc.," "Treatise on the Spleen," "Critical Dissertation on the Spleen," "Discourse on Gout, Rheumatism and the King's Evil," and "Dissertations on a Dropsy."

In 1729, in the same year as Steele, Blackmore died at his home in Essex, whither he had retired seven years before. Even after his death he continued to publish, for he left an unfinished work which appeared posthumously.

When Dr. Samuel Garth published his long and exceedingly fine poem, "The Dispensary," in 1699, all London chuckled over the portraits it recognized there; and none caused more amusement than the figure of The Bard, in which the character of Blackmore was clearly apparent. Garth, though one of the best-natured of men (the phrase is Pope's, and the praise very rare from him), had a lively sense of humor, and throughout his life held his own among the best wits of the day; he was a member of the famous Kitcat Club, that scintillating center where Addison, Steele, Congreve and Lady Mary Wortley Montagu unleashed their tongues and scattered sparkling bon mots. Garth is indeed a striking contrast to Blackmore; he wrote comparatively little, though always with facility; he was gay, witty and well-liked, and wrote at least one immortal poem. A graduate of Cambridge and of Leyden, he settled in London and was elected a fellow of the Royal College of Physicians in 1693, the next year delivering the Gulstonian lectures, his subject being respiration. In 1697 his Harveian Oration was published at the instance of the president of the College. The last page contained a reference to a scheme which had been discussed by the College since 1687, urging the establishment of an out-patient department for people too poor to employ their own physicians. Most of the members of the College were heartily in accord with this plan, but a few opposed it selfishly, in league with the apothecaries, who had made it impossible to carry it out, by keeping the price of drugs prohibitive.

Angered by this selfish policy, Garth in 1699 wrote "The Dispensary" which, describing the first attempt at such an establishment, ridicules the apothecaries and the physicians who had joined forces with them. The poem, which circulated first in manuscript, won great popularity, and went through three editions in the first year of its appearance; in the three hundred odd years since, it has retained an extraordinary vitality. Modeled on Boileau's mock-heroic poem "Le Lutrin," and on Dryden's "MacFlecknoe," it sets forth a mock-Homeric battle between the well-intentioned physicians and their adversaries, with the famous Harvey finally summoned from the Elysian Fields to effect a reconciliation and propose reforms. Almost all the characters have contemporary prototypes; besides Blackmore (The Bard), there are Dr. Francis Bernard (Horoscope), Dr. William Gibbons (Mormillo) and Dr. Charles Goodall (Stentor), to name only the most prominent.

"The Dispensary" both established Garth's fame as a literary man and represents his contribution to English letters. While he wrote a number of prologues and epilogues to plays, dedications, and translations from the classics, nothing else from his pen holds the charm for us of his first long poem. But his character and medical career inspire us with a good deal of the same delight. Although he was knighted on the accession of George I in 1714, and became physician-in-ordinary to the king and physician-general to the army; although he had a large and fashionable practice and grew wealthy in its course, he was never too busy or too proud to help the poor and distressed, and set a shining example to a rather heartless age. When he died, after a brief illness, in 1719, he was buried, according to his wish, beside his wife at Harrow.

John Arbuthnot presents another contrast to Blackmore, the more striking because he, too, started his career by teaching; but so admired and beloved was he by the best minds and highest dignitaries of his day that, if they ever gave the matter a thought, it was only to praise his brilliance and courage. Swift, the arch-misanthropist of all time, said of Arbuthnot that if there were but six like him in the world, he would destroy "Gulliver's Travels." Pope, who cherished for him a lifelong friendship as tender as it was rare, dedicated to him his finest epistle, and publicly addressed him as:

> Friend of my life, which did not you prolong
> The world had wanted many an idle song.

Indeed, Arbuthnot is perhaps more important for the stimulation and sympathy he gave his friends than for his own literary works, though of these one, surely, "Law is a Bottomless Pit," commands more than passing interest. It contains that portrait of John Bull which from Arbuthnot's day to this has been taken as the epitome of the British nation.

Arbuthnot was careless of his own literary fame; his children used his papers for kite tails, and he often handed over his ideas bodily to his friends. He had a keen satirical mind and a terse, unaffected style, so that his pamphlets, many of which were political satires, were extremely popular in their day; however, they lack the broad philosophic angle which gives to Swift's papers on similar themes an undying universality. His first published work was "An Examination of Dr. Woodward's Account of the Flood" (1697), which successfully attacked a crude account which had been published recently. Arbuthnot followed this up with a pamphlet proving the usefulness of mathematical learning, and some years later a treatise on the activity of Divine Providence in regulating the birth of the sexes. With Pope and Gay he collaborated in a poor and unsuccessful farce, "Three Hours after Marriage," and about the same time published the monumental "Tables of Grecian, Roman and Jewish Weights, Measures and Coins reduced to the English Standard."

After the death of his son in 1731 Arbuthnot's health failed; though he wrote an essay on "Practical Rules of Diet," he never observed them himself. He died at Hampstead in 1735, leaving Pope and Swift to mourn him and to publish posthumously the "Memoirs of Martinus Scriblerus," an outgrowth of the Scriblerus Club which the three friends had formed together with Gay, Prior and one or two more choice spirits. These memoirs held up to ridicule metaphysical pedantry and antiquarianism, and laid down a system of education which strongly suggests Sterne's "Tristram Shandy."

Dr. Arbuthnot was a fellow and a censor of the Royal College of Physicians and delivered the Harveian Oration in 1727. Early in the century he had the good luck to be at Epsom when Prince George of Denmark was taken ill there, and treated him successfully, an accomplishment which led to his appointment as physician-extraordinary and later fourth physician-in-ordinary to Queen Anne.

A foreigner by birth, an outcast among his contemporaries, without friends or influence, unsuccessful in his practice, Bernard Mandeville comes down to us nevertheless as the most authentic voice of the six in our group. His "Fable of the Bees" still stands as one of the most penetrating, cynical and powerful philosophic poems in English, remarkable for its virility and simplicity of style, the more so since the author was born in Holland and did not come to England until after he was twenty-one years old. Since its first appearance in 1714 it has often been reprinted; the Grand Jury of Middlesex and the *London Journal* denounced it in scathing terms and called the author a "public nuisance"; the critics of the day assailed it as obscene and immoral (because it tore to shreds the popular Shaftesbury philosophy of optimism). Like "Candide," which it resembles in tone, if not in form, it assails the doctrine that all is for the best in this best of all possible worlds, and sets forth, in a series of ingenious paradoxes, the theory that private vices are public benefits, that extravagance, rather than thrift, increases prosperity (that bears a familiar ring just now!), that virtue originates in selfish and savage instincts and that human nature is essentially vile. All this with an acute cleverness that is almost diabolical, mixed with a strain of unrestrained coarseness. No wonder the polite age of Anne was outraged!

Mandeville was forty-one when the "Fable of the Bees" appeared; for the remainder of his life he went on writing coarse, vigorous attacks on the complacent philosophy and corrupt practice of the day. We no longer read "The Virgin Unmask'd," or "An Inquiry into the Causes of the Frequent Executions at Tyburn," or the "Treatise of Hypochondriack and Hysterick Passions," but they left a deep mark on their own age, and on the trend of English thought. Mandeville, says Edmund Gosse, "was an emancipator of thought, a rude and contemptuous critic of the conventions. In himself base and ugly—for all his writings reveal a gross individuality,—the brute courage of Mandeville helped English speculation slip from its fetters." An amazing achievement, is it not, for an obscure Dutch physician who lived chiefly on a small pension allotted him by some merchants, eked out by what he could earn by writing for distilling interests, in favor of spirituous liquors?

Restless energy of mind was Mandeville's distinguishing characteristic; indolence and inertness that of John Armstrong. Equipped with unusual talent and rich learning, the latter might have accomplished much, but has handed down only one work of lasting merit, "The Art of Preserving Health." This didactic poem in four books, which was immensely popular in its own day, and is still read with pleasure, reveals a masterly grasp of blank verse, a fine imagination and splendid command of diction. But Armstrong never equalled it, nor did any of his prose, brilliant as it is in spots, achieve the level of immortality.

Armstrong, like Arbuthnot, was the son of a Scotch clergyman. His first poem, "Winter," written in 1725 when he was only sixteen years old, won the praise of Thomson, Young and Aaron Hill. It was eleven years later that his first published poem appeared. It was called "The Oeconomy of Love" and so realistic and obscene was it that a contemporary aptly remarked that it did as much to continue the venereal diseases as did Armstrong's treatise on "The History and Cure of Venereal Diseases" to cure them. Before its republication toward the end of his life Armstrong revised the poem and deleted some of the most objectionable passages.

In private practice Armstrong was only moderately successful, which he attributed to the fact that "he could neither tell a heap of lies in his own praise, nor intrigue with nurses, nor associate, much less assimilate, with the various groups of pert, insipid . . . waspy drivelling gossips," though his biographer, Arthur Henry Bullen, thinks it rather due to habitual inertness and a splenetic temperament. He is described in Thomson's "Castle of Indolence" (of which he claimed four stanzas as his own work) in the lines beginning:

> . . . One shyer still, who quite detested talk;
> Oft, stung by spleen, at once away he broke
> To groves of pine and broad, o'ershadowing
> oak. . . .

In 1746 he was appointed physician to the Hospital for Lame, Maimed and Sick Soldiers, and in 1760 physician to the army in Germany, whence he sent "Day," a poetical epistle, to his friend John Wilkes for publication. A misunderstanding over this estranged the friends forever. When the army was recalled, Armstrong returned to London with half-pay for life, and soon went for a tour of France and Italy, during which he visited the dying Smollett in Leghorn. In 1771 he published "A Short Ramble through France and Italy," and two years later, the "Medical Essays," charging his colleagues with incompetency and servility. Much to everyone's astonishment, he left a considerable fortune at his death, despite the smallness of his pension and other earnings.

Strictly speaking, Mark Akenside hardly belongs to the Augustan Age, for his first poem appeared in 1737, when Steele and Addison were already dead and Pope and Swift nearing the end of their careers. At that time he was only sixteen years old, a precocious butcher's son from Newcastle-on-Tyne, who sent his brain-child, "The Virtuoso," to the leading literary periodical of the day, the *Gentleman's Magazine*, and was perhaps the only person not surprised when it was accepted! He continued to contribute to its illustrious pages, the while he started to work on the poem by which his name was destined to live, "The Pleasures of the Imagination." Meantime he was sent to Edinburgh by the dissenters of Newcastle, to study for the ministry; but finding this uncongenial, he soon switched to medicine, refunding the money that had been spent on him. At nineteen, in 1740, he was elected a member of the Medical Society of Edinburgh, which he electrified by the eloquence of his orations; the next year he returned to Newcastle and engaged in surgery, busying himself with literary composition on the side.

When Akenside went down to London in 1743, "The Pleasures of the Imagination" was completed. He offered it for 120 pounds to Dodsley, the publisher, who showed it to Pope, and on being assured by the latter that it "was the work of no everyday writer," published it anonymously. It was a great success, and soon was reprinted, with the author's name. Its three books of unusually excellent blank verse trace the origin of the intellectual qualities which make up the imagination, the enjoyment of exercising them, the action of the passions on the imagination, the origin of vice, and the action of the mind in producing works of imagination. There are descriptive passages of the utmost liveliness, and a maturity of thought and justness of phrase which seem incredible in a boy of twenty-two.

But Akenside was "rapid and precocious, rather than original, and neither in rhetoric nor in medicine did he fulfil the promise of his boyhood," says Gosse; and indeed it is true that after 1746 (he was then only twenty-five) he produced no literary work of merit; and that were it not for the good offices of his friend Jeremiah Dyson in setting him up in practice in Bloomsbury Square, he might never have made professional headway. As it was, he built up a fashionable and lucrative practice, and became physician to Christ's and St. Thomas' Hospital, and, in 1761, to the queen; but unfortunately his success went to his head. Once an ardent Whig, he turned Tory with a vengeance, and he manifested toward his poorer patients at the hospitals such brutality and indifference that he was often on the verge of dismissal. It is told of him that on his periodic visits to the wards he always insisted on having men with brooms precede him and sweep the way, and that he was the original of Smollett's portrait of a physician in "Peregrine Pickle."

Precocious in everything, Akenside died at forty-nine, in the same bed in which Milton is said to have died, which had been given Akenside by a friend some years before. Though much the latest born of the group he was survived nine years by Armstrong, whose death in 1779 brought to an end this golden age of literary physicians. Without precedent, as it has been without successor, it stands as one of the most interesting phenomena of our literary history, and one of the most illustrious of our medical history.

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[From Remarques de M. Winslow, Paris, 1755.]

MEDICINE AMONG THE IROQUOIS*

By ERIC STONE, M.D., F.A.C.S.

PROVIDENCE, R. I.

THE early white had a high regard for the American Indian and not until Europeans had arrived in such numbers that they began to dispossess the Indian of his tribal lands did the Indian and white come into conflict. The civilized race rationalized their indefensible robbery of tribal lands and slaughter of its inhabitants by creating a myth of innate Indian savagery, cruelty and bestiality. Their sophism of bringing a superior faith and culture is adequately demonstrated by the debasement and the blight which this faith and culture brought to the Indian. But our present-day belief in the Indian as a lowly savage and unregenerate animal is inbred in us because of the twelve generations which passed before the Indian was completely subdued and during which white youth was subject to the force of the propaganda. Cruelty and savagery there was, but displayed no more by the Indian than the white. And bestial the Indian never was, instead he was clothed in a dignity and reserve and personal pride which today is a by-word. His religion, philosophy and culture were vivified by a warmth and beauty incomprehensible to the arid material bigots who began the process of his extermination. To these faiths and ideals the Indian clung with such tenacity that many of his ceremonies are conducted today, word by word and motion by motion as they were performed six centuries ago.

Let us try to forget this picture of the Indian as the beast and ogre with which children were frightened into obedience not two generations ago and glance dispassionately at one phase of Indian culture, which should be of interest to us, as physicians, the medical practices of the Amerind.

On the North American continent there were at the time of discovery, three great centers of Indian culture. The Southwest presented its town civilization of great Pueblos, cave and precipice cities and those other monuments that in size and dignity rival the ruins of Greece and Egypt. There were the Plains Indians who were so perfectly adapted to their environment that no change in their manner and customs had been necessary for centuries and where theology, myth and poetry had risen to peaks scarcely exceeded by any European literature. And, finally, there were the Iroquois, whose veritable genius for political organization had made them the sole arbiters of half a continent. At the time of their discovery they presented to the white man a federation of democratic states, functioning perfectly and based on a political philosophy that had seen no application since the fall of Greek democracy.

The Iroquois originally lived on the Canadian side of the St. Lawrence, but were subject to the Adirondack tribe and eventually to escape this persecution migrated into Western New York, generations before Columbus reached these shores. There

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* Read at the annual meeting of the Fourth District Branch of the Medical Society of the State of New York, Schenectady, N. Y.

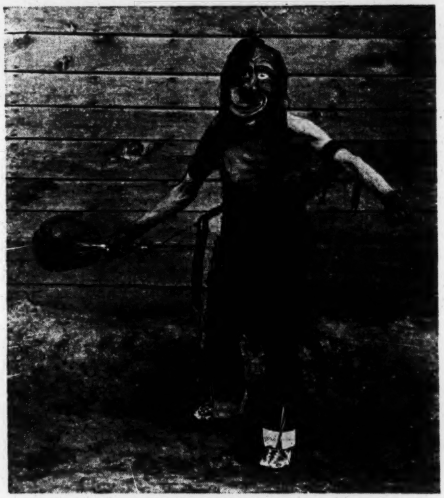

FIG. 1. CAYUGA FALSE FACE DANCER. (COURTESY OF THE MUSEUM OF THE AMERICAN INDIAN, HEYE FOUNDATION, NEW YORK CITY.)

the tribe broke up into bands and dispersed through this area. These bands grew rapidly in the favorable environment and became the five tribes of the famous Iroquois League of Nations. The component tribes were the Mohawk, Oneida, Onandaga, Cayuga and Seneca.

Early in the fifteenth century at the instigation of the Onandaga their league was organized. About 1710 the Tuscaroro, a kinship group, which had been driven out of North Carolina, was taken into the League to make its sixth member. The strength derived from this union of tribes led to their complete supremacy from the Hudson to the Mississippi and from Quebec to North Carolina. What other tribes were permitted to live in this area did so as subject nations. Their early history was one of constant warfare which they developed to a fine art and of perfection of their political organization.

As among all the American Indians medical conditions which were understood or for which simple remedies sufficed were well and very intelligently treated, as common gastrointestinal disorders, simple fevers, wounds and fractures. They were, of course, subject to many diseases the nature of which was entirely unknown to them and seemed to be supernatural visitations. Following a trait characteristic of mankind, when faced with overwhelming or mysterious difficulties, they turned to their gods for aid. Therefore, to understand many of the Indians' bizarre medical practices it is necessary to know something of their religious beliefs.

The American Indians throughout the continent were pantheists, every animal, plant, tree and every aspect of nature was invested with spiritual life. The manifold nature gods were, however, in all tribes, subordinate to one all-powerful Great Spirit who created the world and everything therein. In reality, it was a monotheism with the lesser gods more in the role of servants of the Great Spirit, than deities in their own right, for it was through them that the Great Spirit made manifest his desires to mankind and consummated his mandates. Through them, also, man could communicate with the Deity. The lesser gods were so numerous and so intimately associated with man that few acts were carried on without some deference paid to the deity involved. Where a spoon or bowl is dedicated to a deity, where entry to a lodge involves an obeisance to the god of the hearth, where the sowing of seeds demands an elaborate ceremony, where the partaking of food is preceded by an oblation, it is not surprising to find that the medical practice is deeply tinged with mysticism and ritual.

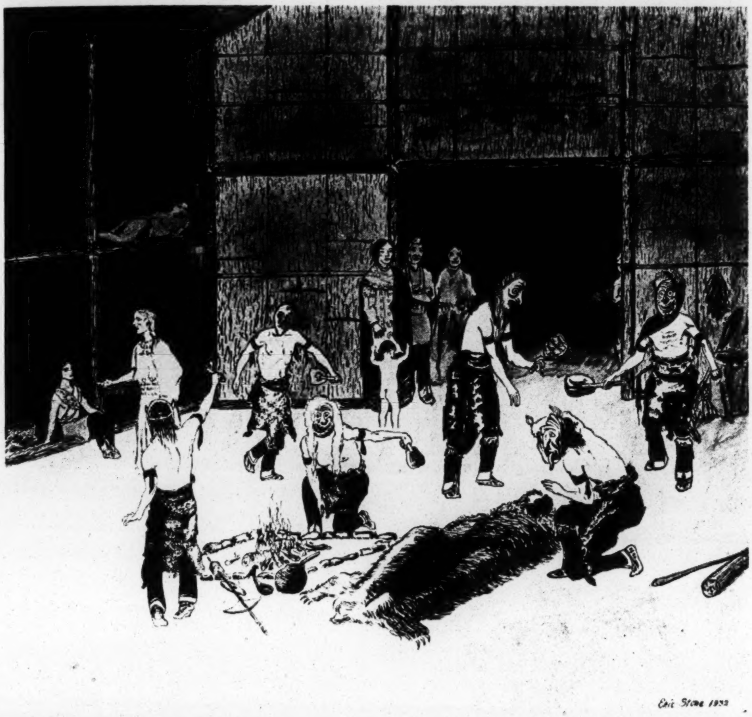

FIG. 2. IROQUOIS FALSE FACE CEREMONY OVER PATIENT. (RECONSTRUCTION BY AUTHOR.)

Indian medicine, then, has two distinct aspects, the practical and the supernatural.

In the field of practical medicine the Indian applied simple remedies found to be of value or apparent value through the method of trial and error. The pharmacopeia consisted of various parts of the indigenous plants and trees with an almost universal use of physical therapy, in which the sweat bath played a prominent part. The sweat baths were taken in almost air-tight huts made of cedar bark. The patient entered the sudatory, stones were brought in at a white heat and the entrance closed with a robe. The patient poured cold water on the stones, producing a dense cloud of steam which quickly caused a profuse perspiration. The usual practice was to plunge into a near-by stream and then retire to the lodge for a nap, wrapped warmly in a bearskin.

In fevers, the Iroquois recognized the syndrome of a dry hot skin, chills, thirst, prostration and muscular pains. Their management of the case seems quite modern as it included rest, sweating, purgation, diuresis and a restriction of the diet to liquids. Copious infusions of elderberries (*Sambucus canadensis*), either the fruit or the inner bark, were given to cause sweating and diuresis, which properties the medicine actually possesses. When the thirst had subsided and the skin had become moist, elimination was further promoted by sweat baths. Boneset (*Eupatorium perfoliatum*) was used as a hot decoction or the bush bean (*Phascolus vulgaris*) was chewed in this or in other conditions where purgation was desired. They also practiced phlebotomy in fevers. A sharp flint was fixed at right angles to the end of a stick, the vein was compressed and the point laid on the vein. A short snap of the finger over the flint thrust the point into the vein.

Phlebotomy was also used to relieve dropsy. The accuracy of the Indian in observation is attested in their practice of purging, sweating and promoting diuresis in such cases, although they had no hint of the cardiorenal basis of the disease. To relieve excessive edema of the legs they scarified the skin with flint knives.

Emetics were widely used by the Iroquois as well as all American tribes, not only to relieve the frequent gastrointestinal disturbances but because emesis was a form of ceremonial purification. Whenever one desired to communicate with the spirit world, it was universally considered necessary to be pure in mind and body. Therefore, prayer and ritual were entered on only after hours of meditation and physical cleansing, inside and out by the use of emetics and by taking sweat baths. Two only of the many emetics are noted. A decoction of the blood wort (*Sanguinaria canadensis*) or a lye made of the ashes of corn cob proved equally effective. On a pinch, the desired effect was produced by tickling the throat with a feather or ingesting large quantities of warm water.

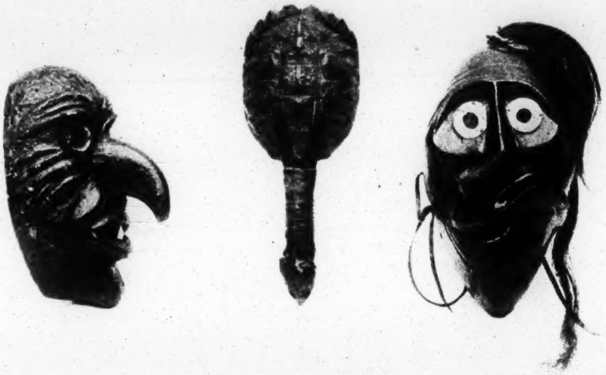

FIG. 3. FALSE FACES AND (CENTER) TURTLE SHELL RATTLE. (COURTESY OF THE MUSEUM OF THE AMERICAN INDIAN HEYE FOUNDATION, NEW YORK CITY.)

Rheumatism and neuritis were common ailments among the Indians due to bad dietary habits and exposure to the weather. For these a multitude of remedies were used. Sweat baths were taken frequently. Internally, the boiled young sprouts of a variety of plants were used, such as wild asparagus (*Asparagus officinalis*), wild pea (*Lathyrus maritimus*), poke berry (*Phytolacia decandra*), cowslip (*Caltha palustris*), or mustard (*Bassica*, var. sp.). Externally, they resorted to hot poultices and sometimes moxas made of a cone of fir twigs, moistened and matted over the affected part, then ignited. Aromatic fumigations were given; a fire was lighted and slow burning aromatic leaves or needles were thrown on it, then the affected limb was held over the embers and a robe thrown over the fire and the part to be treated. Or the leaves and berries of wintergreen were mashed and applied as a dressing to swollen joints. In short, their treatment of rheumatism was quite realistic.

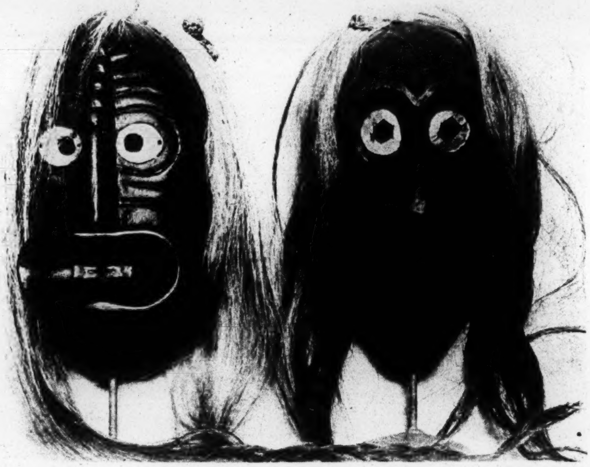

FIG. 4. FALSE FACES. (COURTESY OF THE MUSEUM OF THE AMERICAN INDIAN, HEYE FOUNDATION, NEW YORK.)

In obstetrics, the delivery offered few difficulties as the full bred baby averaged about 2 pounds lighter than that of the half-bred or white baby and faulty presentations were rare. Labor frequently lasted only a couple of hours and rarely exceeded four. When labor was slow, it was believed that a decoction of partridge berries (*Mitchella repens*) hastened the process. An infusion of June berries (*Amelchoir oblongifolia*) was given to lessen pain and to control hemorrhage. Apparently the retained placenta was the major obstetrical problem, if we may judge from the number of ways the Indian managed the condition. Crede's method of expulsion was universally applied by the American Indian generations before it was described by the eminent French obstetrician. A long list of herbs was used, but the commonest procedure, one widely practiced as late as 1875, was to make a fire of corn husks over which the squaw squatted.

In the care of the baby, white Tuscarora corn kernels (*Zea mays amylacia*) were parched and pulverized between hot stones and applied to the navel after the cord dropped off.

The Iroquois present the only example I have found of artificial feeding of babies. They made a mixture of butter and hickory nuts which were dried and ground with jerked bear or deer meat. The mixture was boiled and given, when cooled to the proper temperature, in an ingenious nursing bottle. A bit of dried and greased bear gut was used, a goose quill being tied in at one end while the other was tied after pouring in the pap.

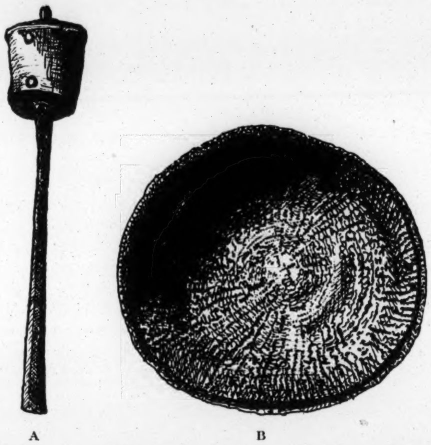

Fig. 5. a. Horn Rattle Used in Seneca Bear Dance. b. Raffia Basket Used for Sacred Tobacco in Ceremony of Mystic Animal Society.

Wounds and contusions were well treated by the Iroquois, although not as skillfully as by some Amerind groups, notably the Plains Indians. In the control of hemorrhage, they used the tourniquet, cautery and bandages of corn leaves. While many tribes knew the use of ligature, I cannot find that it was employed by the Iroquois. Large wounds they sutured with strands of sinew threaded on bone or horn needles. They understood the necessity of causing deep wounds to granulate from the bottom and of maintaining drainage, using two methods of achieving these ends. Where the suture was not used, they packed the wound lightly with chewed tobacco, removing and renewing the packing less deeply on the succeeding days. Or, before suturing, they inserted in the wound a thin sheet of gut or the inner bark of slippery elm.

From the beginning, their treatment of gunshot wounds sounds like a leaf from the medical history of the World War. They did a wide debridement and became skillful in removing the ball and bone fragments. Wounds were bathed frequently in clean water or a lotion of the juice of the roots and stalks of corn. Many varieties of poultices were used on wounds, contusions and swellings. The most famous Iroquois poultice was one made of the hot, boiled flowers of maize.

Their surgery was limited to the opening of boils and the amputation of digits. The Iroquois did not practice drainage of empyema or do foot amputations as did some of the other tribes.

In common with all Indians, the Iroquois were skillful in the handling of dislocations and fractures, the arts being common knowledge of the laity and not confined to their medicine man. They understood the reduction of the fracture and the importance of immobilization. They achieved muscular relaxation by giving an emetic, in the throes of which the skeletal muscles became flaccid. The Iroquois developed a splint for legs, which, in their time, was superior to those used by the whites. They soaked cedar bark until it was pliable and after reducing the fracture, moulded the bark to the limb, the knee moderately flexed, to form an anterior and posterior shell. These were then bound in place by thongs and when dried formed a cast equal to the twentieth century plaster-of-Paris. Where the fracture was compound, they cut a window over the wound and treated it daily as they would simple wounds. Interestingly enough, the Plains Indians had independently contrived a cast, similar to this, moulded of buffalo hide.

While many more details could be given, the foregoing should be sufficient to give a general idea of their legitimate therapeutics, which on the whole, were rational and effective. They were far behind the white in surgery because of the absence of metal instruments, and they knew nothing of plagues inasmuch as they never suffered from them. Their practices were not far behind contemporary white medicine and in some respects were in advance of it.

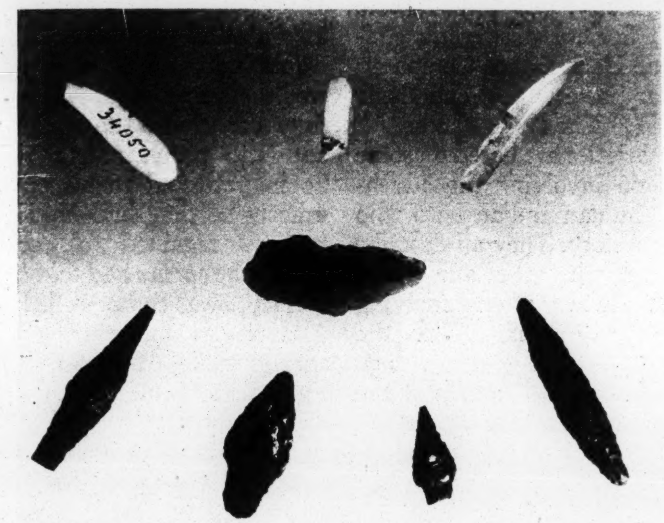

FIG. 6. FLINTS USED AS SCALPELS, SCARIFIERS AND FOR PHLEBOTOMY FROM VARIOUS TRIBES. (COURTESY OF THE NATIONAL MUSEUM, SMITHSONIAN INSTITUTE, WASHINGTON, D. C.)

If, however, the Indian had exhausted his knowledge of herbs and the patient did not improve, it was felt that the disease was beyond the pale of natural maladies and must be due to some supernatural cause. The patient might have omitted some ceremony to an animal before he went on a hunt, or have failed to sprinkle the sacred tobacco over the carcass and the offended animal had cast the disease upon him. Or some ancestor's ghost was restless and was haunting the patient's body. Or, again, he may have failed to attend one of the six religious festivals, or if present, might have made an error in a song or dance step and so brought down upon his head the ire of some slighted deity. So a clairvoyant would be sought, who, by careful scrutiny of the patient's past and interpretation of his dreams, would determine what spirit was causing the evil and prescribe the appropriate medical ceremony for the appeasement of the deity.

These ceremonies were conducted by secret societies, some of which persisted into the twentieth century. There may have been others which have died out, but certain it is that some of the extant societies are of great antiquity. In many of the ceremonies, archaic words, the meanings of which were long ago lost, are repeated with fidelity, generation after generation. There appears in the Jesuit Relation of 1640, a description of the "Little Waters Medicine" ceremony just as it is carried out today and the masks of the "False Face Society" were described by the first whites who came in contact with the Iroquois.

These two are the best known of the secret medicine societies. The others are: (3) Chanters of the Dead (layers of ghosts); (4) The Buffalo Society; (5) Society of Mystic Animals; (6) The Dark Dance Company; (7) The Bear Society; (8) The Eagle Society, and (9) The Husk Faces.

All these societies are based on some myth of origin involving the adventures of the human Indian hero who founded the society. They all describe some meeting with the animal or other deity, always after terrifying deeds of bravery, during which the deity instructs him as to the rituals of the society he is to form and the medicine it is to use. They tell of his adventuresome return and the founding of the society.

The Little Waters Medicine Society is typical of them all. The legend of the origin repeated, century after century, at the ceremony for the renewal of the power of the medicine is as beautiful as any tale of Greek mythology. It tells of a young chief, ages and ages ago, going on a hunt. Separated from his companions, he was beset by a band of hostile Indians who killed him. Now, although a great hunter, he was much loved by the animals, because he never killed cruelly or needlessly and always performed the ceremony of respect for his kill. A wolf skulking through the woods found and recognized the young Chief and in his sorrow, called in all the other medicine birds and animals and they came and decided to bring the kind hunter back to life. So they mixed a medicine and gave it to him. As he was reviving he heard a beautiful song which the animals were singing and he remembered every word of it. The song told him to form a society and hold certain ceremonies at which the song was to be sung and it was to be sung over the sick as a certain medicine was given, and that the song was the medicine song of the animals and when they heard it, they would come near and their power would cure the sick. But when he was fully conscious, the song had ceased and the animals had disappeared. So he returned to his tribe and did exactly as they had bidden him, but he had regained full consciousness before the spirits had told him how the medicine was compounded.

However, on a war party the next spring while camped in a glade in some high mountains, they all heard a song of unearthly loveliness. He sent two of his warriors to discover the source of the song. The song moved away as they neared it and led them through impassable windfalls and tangles, across raging torrents, up and down unclimable precipices, until they, utterly exhausted, reached the peak of the highest mountain. There they found the song emerging from a luxuriant corn stalk, telling them how to prepare the medicine that was to be used in conjunction with the ceremonies revealed the year before. Then the song and voices ceased, the corn stalk faded away and the two Indians found a clear and easy path leading them back to their camp. They used the medicine and nobody wounded on the war party died, and they have used the medicine and songs and ceremonies ever since. The medicine was called "Little Waters" because the dose was so small.

Each member of the society had a packet of the medicine, which was prepared yearly by the Holder of the Song. He was the only living person who knew the secret formula. It was the belief and proved to be reality, generation after generation, for centuries, that the Holder would have a premonition of impending death in time to pass his knowledge on to what successor he might choose. But about 1909, John Patterson, a Seneca, who was holder of the song died suddenly without having instructed a successor. Since then the members have guarded what of the medicine was left with zealous care, using it only in extreme cases, especially as the myth of the origin teaches that when there is no more medicine, the tribe will cease to exist.

The medicine itself was composed of the brains of various animals, birds and fish, the pollen and roots of various trees, plants and vegetables. These were pulverized with some unidentified substances to form a yellow powder, so rich in organic phosphates that it glowed if opened in a dark room. Dr. I. H. Salisbury, a noted physician and at the time New York State Chemist, analyzed samples of the medicine and did some animal experiments finding that it actually possessed physiological action causing a rapid formation of granulation tissue if applied locally.

A patient who wishes to be cared for by a Shaman of the Little Waters Society must first purge himself and then for three days use no fried foods, fat or salt and eat no flesh except white meat. The medicine man then enters the lodge with an assistant who searches for anything that might destroy the "life" of the medicine, decayed food, vermin, filth, soiled garments or menstruating women. When he is certain that no such contamination is present, the patient is screened so that no one but the medicine men may see any part of the body. Another aide has been sent to a stream for fresh water. He must dip a bowlful from the crest of the ripples, according to the sacred song, "as they sang their way down the water road," i.e., in order not to antagonize the water spirits, it must be dipped with, not against, the current.

When all is ready, the water bearer enters. The medicine man sings the ancient song of the animals, accompanying himself with a gourd rattle, as he scatters tobacco on the embers that the sacred smoke may carry his words to the Great Spirit. The water is poured into the sacred cup and the packet of medicine is opened. With a miniature ceremonial ladle, three pinches of the medicine are scooped up and each is dropped on the water in such a way as to form an isosceles triangle. If the medicine floats, the patient will recover, if the water becomes cloudy, the outcome is in doubt, but if it sinks, death is imminent and the medicine man throws away the rest of the medicine and departs.

If the omen is good, some of the medicated water is sprinkled on the affected part and some is taken by mouth, the rest is left to be consumed later. The medicine man ends the ceremony by singing another sacred song. After the ceremony, the family of the patient give the medicine man and his aides a ceremonial meal. He finally departs with a pinch of sacred tobacco, which is his fee.

The society's ceremony for renewing the power of the medicine was held four times a year, in ancient times, in a permanent lodge built for that purpose. Each member must attend, bringing his packet of medicine or his medicine would become useless and ill-fortune would pursue him. The ceremony began at about eleven in the evening and ended at dawn. The evening was opened with a prayer by the Invoker and the rest of the ritual consisted of singing in unison, a series of sacred songs. The singing was done in the dark with the medicine glowing on an altar at the center of the room. The songs retold the myth of origin of the society, rehearsed its mysteries and repeated those sung in treating the sick. The second song, particularly, is the most dramatic and beautiful of all Indian songs, wild, yearning and yet melodic. A water drum and the gourd rattles, of which each member bore one, gave the rhythm of the music. At appropriate points the flute is heard in a peculiarly lovely and poignant air, the call of the whip-poor-will, conventionalized and elaborated.

The practiced leaders employed ventriloquism with startling effect on the novice and the song may appear to be emerging not only from the singing group but from several other places at the same time as from down the chimney, a corner of the rafters or from outside the building.

Each song lasts an hour and a rest period precedes the next during which the pipe is smoked and the sacred wine is passed around. At daybreak, a roasted bear's or boar's head is brought out, from which each member tears a morsel with his teeth. Then, as the members take their medicine packets and depart, each is given a portion of hulled corn soup which has been cooked at the fire altar during the ceremony.

The practices of the False Face Society are based on an elaborate legend which accounts for their superstitious beliefs that diseases are caused by wood spirits, hideous of countenance and found only in the blackest depths of the forest.

The members were all men, except one woman who was known as the keeper of the masks, as she had charge of the regalia. She was also the only means of communicating with the society as the member's identity was theoretically unknown. As late as 1900, there were members of this society in all Iroquois villages.

When conducting the ceremonies the members wore their masks, were naked to the waist and wore, girded around the waist, a tattered robe. Below their knees were fastened horn rattles. Each carried a rattle constructed of the carapace of a turtle. A legend existed concerning each individual mask. These were made of wood and carved as grotesquely as the owner's ingenuity could contrive in order to represent the wood spirits to be propitiated by their dance.

If any ill person dreamed of a False Face, it was a sign that his illness was brought on by the malevolence of some wood spirit and he could be cured through the instrumentality of the society. The Keeper of the Masks was informed and she notified the members. They appeared mysteriously having surreptitiously donned mask and costume; and proceeded to the patient's lodge.

When they entered the patient was placed by the hearth and the company circled around the room in a bizarre dance step, singing their medicine song to the chug of the turtle rattles. After several circuits the embers were stirred and each dancer seized hot ashes and sprinkled a pinch over the patient, carrying out a formulated manipulation, as prescribed in a prayer they murmured. Then the patient was seized and led around in a False Face dance. This ended the ritual and as they left, a feast was presented to the band which they carried off to be consumed in private.

The False Face company conducted two other ceremonies which were in the nature of renewal of their power and the initiation of novices.

The other societies, while varying their deities whose aid was sought and presenting bizarre ways of achieving this result, yet in organization and general pattern were similar to those described. In a few the ritual was more dramatic. The Eagle Society presented a graceful and difficult dance picturing the flight and action of the eagle and made more picturesque by using calumets of eagle feathers. The Society of Mystic Animals was the only one in whose ceremonies feats of magic were performed (a feature typical of the Southwestern medical dances). Performers would toy with red hot rocks and embers with their bare hands, or while blindfolded would discover articles hidden away among the audience.

CONCLUSIONS

These descriptions of the Iroquois ceremonial treatment of disease, treated only at such length because they seem dramatic and curious, should not be emphasized as in reality the major part of their care of their sick was practical and to the point. In fact it was much more effective than much white medicine at that period. As late as 1890, the non-medical whites of the middle west used "mad-stone" for hydrophobia placed a pan of water under the bed to prevent night sweats, used charms and incantations to stop hemorrhage and treated fevers with "nanny tea" a brew of goat's dung. Nor do these ceremonies seem too far fetched when we consider the excitement around a Melrose grave two years ago, or our host of chiropractors, electropaths and cults of faith healers. And, if we recall that the Indians added fifty-nine drugs to our pharmacopeia, we will conclude that these members of a stone age culture had advanced far in practical medicine without the aid of the scientific method, knowledge of physiology, written records or instruments of precision.

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TUBERCULOSIS AND GENIUS:

ROBERT LOUIS STEVENSON

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OKLAHOMA CITY, OKLA.

ROBERT LOUIS STEVENSON'S life represents a peculiar blending of hereditary and environmental factors perpetually colored by the domination of a virile genius. From the Stevenson side of the family, he received a compound of sound sense and subtle humor vitalized by the warmth of his Celtic emotions, a kindly interest in humanity and a zest for the sea. In unbroken succession through many generations, the Balfours evolved from keepers of the King's cellar to the highest places of honor and responsibility. Stevenson's grandfather was the Rev. Lewis Balfour, Minister of Colinton on the Waters of Leith. His grandmother Balfour was the daughter of Dr. Smith of Galston, who in Burn's "Holy Fair," "opens out his cauld harangues on practice and on morals." His mother, the youngest daughter of Lewis Balfour, was a cousin of the novelist Major George Whyte Melville. No doubt Stevenson's propensity for letters, his metaphysical turn of mind and his "love of preaching" may be traced to the Balfours. That he was conscious of the Balfour in his personality appears in the following reference to his grandfather: "He moves in my blood, and whispers words to me, and sits efficient in the very knot and centre of my being."

It is recorded that Lewis Balfour, at the age of twenty, manifested symptoms of a weak chest which apparently disappeared after a winter in the Isle of Wight. However, subsequent events would suggest that even his youngest daughter may have received from him and transmitted to her illustrious son tubercle bacilli, which survived the alleged arresting influences of the Isle of Wight. The scanty reference to Stevenson's mother may be accounted for by the fact that she survived him. He manifested many fine traits directly traceable to his mother. She read to him a great deal and had much to do with his love of good literature. That his affection for her was genuine and lasting is shown by the fact that after his father's death he would not make his final plans for residence in America until he received her approval and her consent to accompany him.

With *spes phthisica* in mind, we may well wonder whether or not early intimate contact with his tuberculous mother may have initiated an infection which directly influenced the trend of his exceptional mind. Granting this is purely speculative from a scientific standpoint, we can say without fear of contradiction that his early social isolation on account of physical frailty did materially influence his mental development. It is reasonable to believe that there was an early colonization of the Balfour strain of tubercle bacilli in his defenseless body. At about eighteen months of age, there was an obvious change in his physical condition. We find in his own writings references to his health which carry us back to the period of early childhood. "My ill health principally chronicles itself by the terrible long nights. I lay awake troubled continually with a hacking, exhausting cough, and praying for sleep or morning, from the bottom of my shaken little body." Or being carried by the nurse and shown the lighted windows across the dark belt of gardens "where also we told each other there might be sick little boys and their nurses waiting like us for the morning." It was at this time in Stevenson's life that his mother was making the rounds at health resorts in an attempt to find a suitable climate for her own pulmonary condition.

His nurse, Allison Cunningham, whom he affectionately termed "Cummy," came to him when he was only eighteen months old. Under her guidance he spent "a covenanting childhood" and acquired a love for romantic Scottish history, and through this influence, according to his own letters, he largely conceived his literary style. She bitterly denounced cards, theaters and the novel. Her devoted pupil temporarily acquiesced, though he was destined to write both novels and plays. In spite of all this, the last time they saw each other he said, "It's you that gave me a passion for the drama, Cummie." When she remonstrated, "I never put foot inside a playhouse in my life," he said "Ay woman, but it was the grand dramatic way ye had of reciting the hymns."

At twenty he wrote a paper on nurses and at thirty-five he dedicated "A Child's Garden of Verse" "To Allison Cunningham from her boy." Until ten years of age, much of his time in summer was spent at Colinton. He apparently considered this his "Golden Age" as attested by many references. "There is something so fresh and wholesome about all that went on at Colinton Manse." No doubt he was totally unaware of the vicious circle followed by the Balfour tubercle bacilli from the Minister of Colinton through his tuberculous daughter to the grandson, who periodically returned to the remote source of his affliction for the renewal of his strength.

There were thirteen children in the Balfour family and the Manse served as a rendezvous for the forty grandchildren who "came home to her to be nursed, to be educated, to be mothered from the infanticidal climate of India. There must sometimes have been half a score of us children about the Manse. It was strange when a new party of these sallow young folk came home." In the light of our present knowledge it would be interesting to know how many of these sallow youngsters harbored the family strain of the tubercle bacillus. For two generations the Stevensons had been builders of lighthouses and guardians of the sea, yet they sailed the sea of life without the saving light of Robert Koch's discovery.

Among his cousins at Colinton, he was usually accorded the place of leadership. It is not clear whether this was out of consideration of his physical frailty or an early manifestation of genuis. In his own words his fancies ever culminated in a "fury of play" and he was "invariably exhausted to death by the evening." Nevertheless, his inadequate body always responded to the driving force of his dynamic brain. The following furnishes a striking picture of Stevenson at this period: "His limbs were long, lean and spindling and his chest flat. His brow was oval and full, over soft brown eyes that seemed already to have drunk the sunlight under southern vines." His schooling was very irregular and unsatisfactory because of a combination of ill health and psychic inconsistency. He would have nothing to do with conventional society; he threw to the four winds his family traditions. He was proud to become a member of the "Speculative Society" at the University of Edinburgh, made famous by such men as Scott, Jeffrey, Horner, Constant, Robert Emmet and many others.

During his school days he constantly studied words and practiced the art of writing. He gave up engineering for letters, not because of his health, but because he liked to write; however in all probability he liked to write because of ill health. Physical limitations provided time for reading and writing and inhibited his propensity for a life of action. Whether or not we attribute to the tubercle bacilli any power of psychic stimulation, we must admit that his disease had much to do with the flowering of his genius.

Following the trend of genuis, his views of life, religion and ethics failed to conform to his family traditions. The father could yield everything except religious dogma. The breach was inevitable and at times deplorably wide. However, the seasoning of age brought a change of heart and through the gradual evolution of mutual tolerance came comprehension and reconciliation, with a fine appreciation of each other. One of Stevenson's cousins made the following significant statement: "And in the Vailima prayers I seem to hear again an old melody that I know well—the echo of his father's words and daily devotions." He had days of misery and depression, but his troubles were chiefly subjective and his periods of melancholy gave way to buoyant days of happiness. At the age of twenty-one he definitely gave up engineering with the avowed purpose of following literature as a profession. His father was resigned, but with great foresight, as he thought, seeing his son as a "failed author," he prevailed upon him to study law. Young Stevenson acquiesced, in the opinion that this course would "add more or less to his general culture." In later life he referred to his abandonment of engineering as follows: "I date my new departure from three circumstances; natural growth, the coming of friends, and the study of Walt Whitman." Referring to his transition from a period of shirking idleness to one of striving and industry, he says: "There stood at the wheel that unknown steersman whom we call God."

Among the closest of his early friends was Sir Walter Simpson, the son of Sir James Y. Simpson, who played an important part in giving anesthesia to the world. Another was Fleming Jenkin, of whom he later writes in the following words as he gathers data for a biography: "To dig into the past of a dead friend, and find him, at every spadeful, shine brighter." It was Jenkin's wife who said after he had let her out the door at 17 Heriot Row: "As he opened it, the light of the gas-lamp outside fell on him, and I saw a slender brown long-haired lad, with great dark eyes, a brilliant smile, and a gentle deprecating bend of the head. As I sat down to dinner I announced, 'I have made the acquaintance of a poet!'"

When twenty-two years of age, through sheer good fortune and humorous circumvention, he passed the examination for the Scottish Bar. Refreshing glimpses into the practice of his profession are to be found in the interesting entries in his diary of 1872. The faltering sense of duty which daily brings him to his office is obviously overshadowed by his love of nature and his interest in humanity, especially the dissolute and vagabondage types and the neglected child. It is easy to predict that law will fare no better than did his engineering.

In 1873 he met Mr. Sidney Colvin, in whom he found a lifelong friend. This friendship ultimately resulted in the publication of the "Vailima Letters," the two volumes of Stevenson's other correspondence, and the final presentation of his complete works. Mr. Colvin promptly recognized in him social charm, ready wit and the "master spirit" of genius. A hard winter, an attack of diphtheria and his father's displeasure because of his careless living and free thinking, contrived to bring about a decline in his health. His friends insisted on his seeing Dr. Clark of London (afterwards Sir Andrew Clark) who made a diagnosis of nervous exhaustion with a threatening of phthisis. The treatment called for a winter in the Riviera and "complete freedom from anxiety and worry." In November he settled in Mentone where with "numbness of spirit, he rested and gained strength." While here he read George Sand and gathered experience for his paper, "Ordered South."

On account of his depleted condition, he was too weak to enter into the usual activities or to engage in animated conversation, consequently he had much time for introspection and the consideration of his moral doubts. Believing death was not far away, like many tuberculous patients, he worried about the cost of his illness which he referred to as a "huge loan which, by the hands of his father, mankind had advanced him for his sickness." Thinking he would die and not be able to repay, he "lived in an upper room and grudged himself all but necessaries." As he improved he was cheered by the prospect of restoration of health and being able to help mankind, "as mankind, out of its treasury, had lent a help to him." In December he was much better and was reading out two candles instead of one. At this time he was greatly cheered by the coming of his friend, Mr. Colvin, who supplied the quiet companionship and the intimate conversation he so greatly needed. They spent a few days at Monte Carlo and were scrutinized with great curiosity because they remained quietly at home while everybody else gambled all night.

The latter part of his stay in Mentone was characterized by rising hopes and buoyancy of spirit which accompanied his progressive physical well-being. In April he met his cousin, R. A. M. Stevenson, in Paris where he remained a few weeks before returning to the more northerly climate of Scotland. For several years little is heard of his health. He was pleased to find a warm welcome at home and surprised at his father's proposal of a generous readjustment of his allowance, which had always been lamentably small.

He attended lectures at the University the winter of 1874, and in July 1875 he passed his final examinations and was called to the Scottish Bar. Although his name appeared on a brass plate at 17 Heriot Row, he never entertained serious intentions with reference to the practice of law. With his increased allowance he could lead a more independent life, consequently he spent much of his time in London, Paris and various resorts in Europe. It was no longer necessary for him to consider his favorite pursuit as supplementary to professional studies so he plied the pen assiduously with little prospect of wide recognition. Not only was his father disappointed, but many of his friends looked with disapproval upon his unconventional career. Nevertheless, this irresponsible youth was intensely sincere, extending sympathy to all who suffered, finding comfort in the manifestations of nature, possessing a rare appreciation of the beautiful. Such a soul cannot escape creative forces.

It was at this point in his career that he met the poet W. E. Henley. Henley had come to Edinburgh to be under the care of the great Lister, who was to initiate a new epoch in surgery. This meeting resulted in a lasting friendship based upon mutual appreciation of literary attainments and Henley's gratitude for the many attentions bestowed upon him by Stevenson during his long stay in the Edinburgh infirmary. Henley had already lost one leg because of tuberculosis of the bones and he had come to Lister with the hope that the other might be saved. So Lister's Hospital served as a rendezvous for these two versatile victims of a disease, possessing rare intellectual associations.

In 1874 Stevenson was honored by being elected a member of the Saville Club, where he met many celebrities and became identified with the intellectual life of London. During this period of his life he made many leisurely trips, gathering material for his numerous delightful papers. He mastered the French language and spent much of his time among the artists' colonies. Perhaps his favorite haunt was Barbizon, home of Millet, surrounded by fields still vibrant with the story of the Angelus and made fragrant by the aroma of the forest which enveloped the modest green-shuttered home of Millet and floated across the quaint threshold of "that excellent artist's barrack," Siron's Inn.

With his increased allowance he had more of life but was none the less penniless. He must have had many moments of discouragement, yet his reaction to his social environment was marked by the most animated conversation with utter oblivion of his material handicaps. Those who knew him best marveled at his mirthful optimism. He often traveled with only "a great coat and a tooth brush." Manhood consisted of getting rid of material attachments. "As long as you were bound down to anything —house, umbrella, or portmanteau— you were still tethered to the umbilical cord."

Upon one of his excursions to Grez he met Mrs. Osbourne, who because of domestic infelicities and a desire for educational advantages, had traveled with her family from California to France. As though the fates had planned their meeting for his express benefit, he fell desperately in love with her and in spite of all obstacles and the dissuasion of his relatives and friends, he remained faithful to this love. It may be that Mrs. Osbourne's return to California, his limited finances and the attitude of his friends with reference to his love affairs had something to do with a more serious turn of mind as manifested in a letter to his father, which closed as follows:

> Strange as it may seem to you, everything has been in one way or another bringing me a little nearer to what you think you would like for me to be. 'Tis a strange world indeed, but there is a manifest God for those who care to look for him. . . . P. S. While I am writing gravely, let me say one word more. I have taken a step toward more intimate relations to you, but don't expect too much of me. . . . Try to take me as I am. This is a rare moment, and I have profited by it; but take it as a rare moment. Usually I hate to speak of what I really feel, [to] that extent that when I find myself cornered, I have a tendency to say the reverse.

This postscript was probably in anticipation of the breach which the affairs of the heart promised to make inevitable. Even though circumstances were such as to warrant divorce on the part of his beloved, he could not expect his parents to approve his marriage. Evidently he was saddened by the thought of separation from his parents and friends without hope of return. While awaiting developments, he went to Monastier, an isolated place near the sources of the Loire, where he worked hard on his "New Arabian Nights" and "Picturesque Notes on Edinburgh." No doubt the latter were more picturesque because his thoughts were colored by a sense of exile.

The following indicates the trend of his thoughts at this time: "How the world gives and takes away, and brings sweethearts near only to separate them again in distant lands; but to love is the great amulet which makes the world a garden; and hope which comes to all, outwears the accidents of life, and reaches with tremulous hand beyond the grave and death." The trials of separation were sharpened by the news of Mrs. Osbourne's illness. Nevertheless, his spirit was soaring high because of simultaneous news of the hopeless condition of her domestic affairs and that divorce would be acceptable to her family.

Against the advice of all his friends and without the knowledge of his parents, on August 7, 1879, he sailed for America. He considered it useless to look to his parents for either moral or financial support, so he bravely faced the long-felt duty of making his own way in the world. He traveled second class in order to have a table for his writing, but he lived steerage with emigrants as his special concern. "The Amateur Emigrant" was the result. On August 18, Stevenson landed in New York. Failing to find his friend Will H. Low, the artist, his first night was spent in a cheap Irish boarding house but as we may guess, not wholly without compensation. "A little Irish girl is now reading my book [Travels with a Donkey] aloud to her sister at my elbow; they chuckle and I feel flattered." The next day he visited magazine publishers with no success. Apparently they were no wiser then than now. Before the day passed he was on an emigrant train bound for California with the added burden of a six-volume edition of "Bancroft's History of the United States." Six days on the train, with insufficient food and nowhere to lay his head, wrecked his resistance. The bars were down with disease running wild. Mrs. Osbourne was better but he was spent. For want of intelligent guidance, he added insult to injury by traveling another hundred and fifty miles to the south where he camped out by himself in the Coast Range of Mountains beyond Monterey. Completely exhausted he "lay out under a tree in a sort of stupor" two nights. Finally he was rescued by the keepers of a goat ranch.

Strengthened by food and good care, cheered by the romantic circumstances and charmed with the enchanting environment, he made capital of his misfortunes as usual. "I am now lying in an upper chamber with a clinking of goat bells in my ears, which proves to me that the goats are come home and it will soon be time to eat. The old bear hunter is doubtless now infusing tea; and Tom the Indian will come in with his gun in a few minutes."

Soon he was able to leave the ranch nd travel down to Monterey, where e was fortunate enough to find lodging in a physician's home. Through his presence and through his pen, this quiet Spanish village came into the shining light of romance. Though apparently convalescent from his recent break, the strain of the interminable love tangle, and overexertion may have contributed to an attack of pleurisy. But not even this intermittent painful stabbing could interrupt the optimistic sweep of his indomitable courage. He writes his old friend Henley, "There is something in me worth saying, though I can't find just what it is yet." It seems most fortunate that this connoisseur of restaurants found gastronomic satisfaction here as attested by the following: "But take them all in all, not one can be compared with Simoneau's at Monterey."

In December he went to San Francisco where he considered it necessary to live on seventy cents a day. The day after Christmas this ardent conversationalist writes: "For four days I have spoken to no one but my landlady or my landlord, or to the restaurant waiters." Soon he found it necessary to drop from a "fifty-cent to a twenty-five-cent dinner." He requested his friend, Mr. Charles Baxter, to place his books in Edinburgh on sale in order that he might have money to live on. He worked incessantly and occasionally his articles were published in this country and in Europe, but with little profit. While in San Francisco he read Herman Melville's "South Sea Idylls" which in all probability awakened the hereditary urge for the romance of the seas and unfurled psychological sails which were ultimately to carry him to his beloved Samoan Islands. His father, hearing of his illness, softened and sent a twenty pound note which unfortunately miscarried. At this period one of his friends writes, "However ill he might be, he was always gay, eloquent and boyish, the peculiar youthfulness of spirit which was destined to last him to the end."

After sitting up nights with his landlady's sick child, he was physically exhausted. According to a letter to his friend Mr. Gosse, "He was on the verge of a galloping consumption, subject to cold sweats, prostrating attacks of cough, sinking fits in which he lost the power of speech, fever, and all the ugliest circumstances of the disease." As he seemed to be approaching "the grey ferry" the divorce was secured; his father had not only come to his rescue financially, but had consented to his marriage, which took place May 19, 1880. Suffice it to say that among the many tributes to his wife in poetry and prose, the latter which appeared only a short time before his death seems all embracing: "As I look back, I think my marriage was the best move I ever made in my life. Not only would I do it again, I cannot conceive the idea of doing otherwise."

Not only did she become a "fellow-farer true through life," but she succeeded in promptly overcoming all prejudicial barriers which had harried the sensitive soul of her ardent lover; she received the stamp of approval from his parents and friends alike. His own father was so impressed with her that he made his son promise "he would never publish anything without Fanny's approval." In "The Silverado Squatters" is to be found an account of his isolated honeymoon in a deserted mining town where love, careful nursing and good food worked a revolution in his health. Soon they decided to return to Europe, Stevenson more than ever before realized the power of parental love and longed to see his father and mother. Though his health had improved, he was not equal to the inclemency of a Scottish winter. His uncle, Dr. George Balfour of Edinburgh, diagnosed his condition and advised a stay in the Alps. Dr. Andrew Clark of London confirmed the diagnosis and acquiesced in the plan of treatment.

On November 4, 1880, he became a patient at Davos Platz. In addition to the satisfaction derived from following the advice of his physicians, he found here a kindred spirit in John Addington Symonds. "Beyond its splendid climate, Davos has but one advantage—the neighborhood of J. A. Symonds." With Stevenson unable to participate in any physical activities, and with the old theory of *spes phthisica* yet unsolved, one may well wonder how the environment alone could account for the bouyancy of spirit which makes him so "stingingly alive."

Witness the following from "The Stimulation of the Alps":

> There is nothing more difficult to communicate on paper than this baseless ardour, this stimulation of the brain, this sterile joyousness of spirits. . . . Yet it is notable that you are hard to root out of your bed; that you start forth singing, indeed, on your walk, yet are unusually ready to turn home again; that the best of you is volatile; and that although the restlessness remains till night, the strength is early at an end.

To continue we find the following references to this same puzzling exuberance. After enumerating all that heaven and earth can do to accentuate the beauties of an enchanted landscape, he exclaims, "And yet you have gone no nearer to explain or even to qualify the delicate exhilaration that you feel—delicate you may say, and yet excessive, greater than can be said in prose, almost greater than an invalid can bear. . . . Is it a return to youth, or is it a congestion of the brain?" This feverish racing of the mind and rapid recording of thought when tuberculosis is active keeps alive the suspicion that the toxins of the tubercle bacillus may serve as a whip to drive the mind safely over the physical mire. He was permitted to work two hours in the morning and one in the afternoon, consequently this period was not wholly unproductive. "Virginibus Puerisque," a volume of collected papers, was given to the press, also other articles were prepared for magazines. Among his poems of this period are to be found the complimentary lines addressed to Dr. John Brown of Edinburgh, the beloved physician who wrote the delightful story, "Rab and his Friends."

In September the weather prompted them to return to Edinburgh, then quickly to London, Paris and back to Davos by October 18. This winter they were in a chalet belonging to Hotel Buol, where Symonds was staying. Stevenson was in better health and consequently more eager for work and play. "Treasure Island" was appearing in serial form and the last half was completed with the same zest which characterized the creation of the first half. During this winter he worked hard. In addition to "Treasure Island" he turned out several magazine articles and "The Silverado Squatters," but many of his undertakings remained incomplete. In the spring he was able to say, "I have written something like thirty-five thousand words since I have been here, which shows at least I have been industrious." To this season belongs "The Celestial Surgeon" which is so representative of Stevenson the man.

> If I have faltered more or less
> In my great task of happiness;
> If I have moved among my race
> And shown no glorious morning face;
> If beams from happy human eyes
> Have moved me not; if morning skies,
> Books, and my food, and summer rain
> Knocked on my sullen heart in vain;—
> Lord, thy most pointed pleasure take
> And stab my spirit broad awake;
> Or, Lord, if too obdurate I,
> Choose thou, before that spirit die,
> A piercing pain, a killing sin,
> And to my dead heart run them in!

Here we have a consciousness of duty beautifully expressed, a subtle declaration of aims and ambitions, a striking example of a soul's courageous perseverance. Under the influence of the fascinating cadence of his phrases it is difficult for one to anticipate the piercing thrust of thought, the keen rapier of genius.

He now gladly received from Dr. Ruedi permission "to live in France, fifteen miles as the crow flies from the sea, and if possible near a fir wood. This is a great blessing; I hope I am grateful!" By May 20, 1882 he was in Edinburgh, having already stopped at Burford Bridge where he revived his friendship with Mr. George Meredith. It is pleasing to note that he joined his aging father for a journey to Lochearnhead, hard by the Braes of Balquhidder. Here he was able to gather traditions about the Appin murder to be used in "Kidnapped." They planned to spend the summer in the Manse of Stofo in Peeblesshire. The Manse was sunless, the weather unfavorable and the result unsatisfactory. Unfortunately we have no available record of Ruedi's reaction to this attempt to live in Scotland after his expression of gratitude for permission to live in Southern France.

After a change he again consulted Dr. Andrew Clark. Following the advice of Dr. Clark, he was in Speyside by the latter part of July. Later he was joined by his family at Kingussie, where his last period of residence in his beloved Scotland was spent by "the golden burn that pours and sulks," only to be rudely interrupted by a pulmonary hemorrhage, that fitful crimson burn which for him was to "pour and sulk" with frightful uncertainty, at irregular intervals, throughout the remainder of his life. He again hastened to Dr. Clark and was gratified to find that his opinion was not unfavorable. Since Davos had not agreed with Mrs. Stevenson, they now turned to France. His wife being unable to go with him, and he being too sick to go alone, he was accompanied by his cousin, R. A. M. Stevenson. After trying several places, with one hemorrhage in the interval, he decided upon Marseilles. His wife joined him in October and in a few days they were settled in Campagne Defli, where they hoped to remain for several years. He wrote, "The tragic folly of my summers is at an end for me." Here one might justly pause to hope he had learned his lesson, but never did he display genuine evidence of this until finally settled at Vailima. Even then his physical activities often carried him far beyond the bounds of safety.

His progress at Marseilles was wholly unsatisfactory. Prompted by progressive weakness and the fear that he might become too ill to travel, he went to Nice. Here he found relative comfort and happiness. By March he was able to welcome his friend Mr. Colvin as his first visitor. With improvement in health he found strength to capture and record the product of genius. During this period he wrote his mother, "I may as well tell you that my marriage has been the most successful in the world. She is everything to me; wife, brother, sister, daughter and dear companion; and I would not change to get a goddess or a saint." To add to the success of this period he received a hundred pounds for the book right of "Treasure Island." This marked the beginning of his material independence. This represents only the advanced payment, the royalties amounted to over two thousand pounds. His delight is partially revealed in the following lines: "A hundred jingling, tingling, golden, minted quid. Is not this wonderful? It is dreadful to be a great big man and not to be able to buy bread."

"Black Arrow" ran serially in *Young Folks*. The reception was enthusiastic with marked increase in the circulation of *Young Folks*. It is said that this story at one time was seriously threatened by pressure from the publishers. Stevenson afterwards admitted that upon one occasion during periods of travel he was separated from his proof sheets and had forgotten where he last left some of his principal characters. The death of his friend, Walter Ferrier, occasioned his first genuine mourning and his mind again turned to his former gesture on "Lay Morals." In reconsidering this difficult subject, which never was completed, he writes his father, "A fine opportunity to pray for me. Lord defend me from all idle conformity to please the face of man; from all display to catch applause; from all bias of my own evil."

The Stevensons were now living in Hyére's in Chalet La Solitude "with a garden like a fairy story and a view like a classical landscape." Approximately one year spent here constitutes one of the happiest periods in his life. "Treasure Island" was published as a book and its enthusiastic reception was a source of great satisfaction. Unfortunately overwork, the coming of two of his old friends, and their trip to Nice with a mutual touch of in-temperance, resulted in a cold. This promptly culminated in a serious condition: evidently a pneumonia or an acute spread of the tuberculous condition. A consultation of doctors resulted in a grave prognosis. A few weeks later he is convalescent and writes his mother, "I survived where a stronger man would not . . . Z told me to leave off wine, to regard myself as an old man, and to sit by the fire. None of which I do." Evidently Stevenson considered this a non-tuberculous condition since he writes, "As for my consumption, we can learn nothing until Vidal sees me, but I believe the harm is little, my lungs are so tough." Nevertheless this acute attack was followed by continued ill health for a period of three or four years. Soon after the acute illness he had a frightful hemorrhage. Choking with the flow of blood, he made signs for a pencil and paper and with a steady hand wrote, "Don't be frightened; if this is death, it is an easy one." When in great agitation his wife attempted to administer his ergotine he measured his own dose and returned the bottle and glass with a reassuring smile. This hemorrhage with its attendant restlessness was followed by painful sciatica, Egyptian ophthalmia and possibly laryngeal tuberculosis, as it is stated that for the first time he was placed on absolute silence. Evidently with a view of securing local rest, his right arm was in a sling.

In spite of all these afflictions, his mind was active, his creative powers ever clamoring for expression. Consequently each day after his wife grew weary making up tales for his amusement, his poor faltering left hand was forced to record new verses for his "Child's Garden." Improvement was gradual but steady and by the 1st of July he was in England where he was to spend the next three years of his life. His return was largely for the purpose of securing professional advice with reference to his health. Since his doctors could not agree as to the necessity of his going abroad, he decided to remain in England, a decision which was largely influenced by the continued ill health of his father. During this period, 1884 to 1887, he resided at Bournemouth only a short distance from London.

To the success of "Treasure Island" was soon to be added "A Child's Garden of Verses," "Prince Otto," "Dr. Jekyll and Mr. Hyde" and "Kidnapped." The power of his indomitable genius finally prevailed and Robert Louis Stevenson was widely acclaimed a man of letters.

The following winter at Bournemouth proved fairly successful and his father was so pleased to have his loved ones near him he bought a house and presented it to his daughter-in-law. It was called Skerryvore after the famous lighthouse which is outstanding among the family engineering feats. Here Stevenson received many of his old friends and distinguished guests, though the list was always limited because of his ill health. Among his new acquaintances was Mr. Sargent, who came to paint his portrait; Sir Percy Shelley, son of the poet whose genius also had tuberculosis as a fellow traveler, and his beloved physician Dr. Thomas Bodley Scott of Bournemouth, who inspired Stevenson's beautiful tribute to his physicians. In the fall of 1886 his father, in order to be near him, moved to Bournemouth, but Stevenson was too ill to see much of his father or to be of any comfort to him. In April his father was so ill it became necessary to take him home, where he died May 8, 1887. Louis arrived two days before his death and was greatly shocked to find his father unable to recognize him. He took cold and was not permitted to attend the funeral. Three weeks later he was permitted to return to Bournemouth but physically he was in a sad plight. His three years there represented a continual struggle with disease which at one time, in retrospect, caused him to exclaim: "Remember the pallid brute that lived in Skerryvore like a weevil in biscuit." Probably with this physical struggle in mind, he writes his mother paying tribute to his father and adding: "He, at least, is out of his warfare, as I could sometimes wish I were out of mine."

Dr. Balfour and Dr. Scott now agreed that he should have a change and recommended Colorado. His mother agreed to accompany them and soon all arrangements were made. Before the appointed time he was laid low by the sudden onset of hemorrhage. August 22, 1887 they sailed on the steamship Ludgate Hill, landing in New York September 7.

In this article we have followed the life of Stevenson through formative periods, attempting to reveal the unconventional trend of an exceptional personality and the subtle unfolding of a rare genius under the influence of disease; we have witnessed the crystallization of the dominant hereditary and environmental factors, thus establishing fixed determinants for his behavior and literary expression; we have observed his early laborious struggles with the pen; his long-deferred recognition and the fruitful results of his maturity. Having made these observations, it is most unfortunate that space will not permit a detailed account of the few remaining years so filled with romance and adventure. Suffice it to say that his return to America, in contrast with his former visit, was marked by a generous recognition of his merit. In New York he was sought after by all who possessed a genuine appreciation of letters. His "Dr. Jekyll and Mr. Hyde" was being presented by Richard Mansfield and "Deacon Brodie" was also on the stage. Publishers were vying with each other in attempts to secure contracts for his work. St. Gaudens gathered the necessary data for his large medallion of Stevenson. Soon after his departure from England he was elected to membership in the Athenaeum Club of London because of his eminent attainments in literature. His frail body was scarcely equal to the pressure of glorious achievement. He must, as he thought, quietly slip away for climate, which fortunately brought seclusion, the latter by far the more important in his case.

Fearing Colorado Springs would be too high for Mrs. Stevenson, Saranac Lake was chosen. The now famous Stevenson Cottage was secured and the family went into winter quarters at Saranac Lake October 3 where they remained until the middle of April. In spite of their disappointment in the climate, Stevenson improved and he was pleased to find it reminded him of Scotland, "Without peat and without heather." In our own Dr. Trudeau he found a skilled physician and a genial companion. However he shied at the thought of the Sanatorium and the Laboratory, he preferred to remain ignorant of what he considered the unpleasant facts of his disease. According to Dr. Trudeau, "He evidently felt this, for, after he had written 'The Lantern Bearers,' I got him one day into the Laboratory, from which he escaped at the first opportunity with the words, 'Trudeau, your light may be very bright to you, but to me it smells of oil like the Devil!'"

When Stevenson gave up engineering against his father's judgment he did not relinquish his love of the sea. How different it might have been for father and son if the elder Stevenson could have foreseen the constant ebb and flow of this traditional family tide, like the inescapable mark of a primitive instinct; if he could have only anticipated his son's ultimate decision that he would be willing to give up fame and all its emoluments: "For a good seventy-ton schooner and the coins to keep her on," and that he should finally say, "It was that old gentleman's blood that brought me to Samoa." He loved a ship "as a man loves Burgundy or daybreak," and while still in the heart of the Adirondacks, he was laying plans for an intimacy with the sea, the scope of which would have astounded his weather beaten ancestors who had toiled in "the surfy haunt of seals and cormorants."

By the middle of April he was back in New York City for a fortnight, which was always memorable because of an afternoon on a bench in Washington Park with "Mark Twain." At this time his wife was visiting her people in California, commissioned with the duty of searching for a suitable seafaring craft. Soon a wire came announcing the availability of the *Casco*, a topsail seventy-ton schooner. While the messenger waited, Stevenson made the decision which was to separate him and his friends forever and place the breadth of two seas and a continent between him and his beloved Scotland.

On June 7th, he arrived in San Francisco and two weeks later, much the worse for his trip and a fortnight in San Francisco, he cleared the Golden Gate and sailed away to the limitless stretches of southern seas where he was to secure first hand "knowledge of what men and ships do in that wild and beautiful world beyond the American Continent." According to his wife's account, he was "counting on the warm sea air as the strongest factor in his cure, if cure it was to be. If, on the other hand, it was to be death, he wished it to be so far away from land that burial at sea should be certain."

To leave the story of the Southern Seas untold is to suffer a great loss, but the limited scope of this paper permits only a brief reference to the fact that his health was much improved and his strength greatly renewed. No doubt this was due to physical restrictions fixed by the limited confines of a small boat rather than the "warm sea air." The only recorded flares and the only hemorrhages during this period can be accounted for by a departure from his established sailing routine. Going ashore for any time with its attendant physical exertion or taking cold because of altered environment, seemed to be the causative factors.

In addition to his literary productions during this period so familiar to all, should be mentioned his visit to the Island of Molokai where he spent one week in Father Damien's leper colony whole-heartedly giving himself to the task of comforting and helping these unfortunate victims of a loathsome disease. The following furnishes an incomplete account of his sentiment:

> On the whole, the spectacle of life in this marred and moribund community with its idleness, its furnished table, its horse-riding, music, and gallantries under the shadow of death, confounds the expectations of the visitor. He cannot observe with candour, but he must see it is not only good for the world, but best for the lepers themselves to be thus set apart.

Father Damien had died a short time before Stevenson's visit, but he was greatly impressed with the wonderful work he had done and later risked his own life through both mental and physical strain in defence of Father Damien, whose good name was being unjustly slandered by Dr. Hyde, a Presbyterian minister in Honolulu. No doubt this event had much to do with the break and sudden profuse hemorrhage Stevenson suffered in Sydney, interrupting forever his proposed trip to England. He had already purchased the four hundred acres on the Samoan Island, which was to become his permanent residence. After another voyage with the hope of again restoring his health, he returned to Samoa and settled on his own plantation to which he gave the Samoan name Vailima or Five Waters, derived from the stream and its tributaries flowing through his place.

The fascination which the South Sea cruises held for Stevenson may be surmised from the following: "This climate; these voyagings; these landfalls at dawn; new islands peeking from the morning bank; new forested harbours; new passing alarms of squalls and surf; new interests of gentle natives—the whole tale of my life is better to me than any poem."

Now comes the happy round of three years' settled residence at Vailima with relatively good health, with the joy of home and family; with universal respect and honor; with the satisfaction of mature literary judgment and the blessing of outdoor chores; with the responsibility of a plantation and the "umbilical tethering" of home. Of this period he says: "It is like a fairy-story that I should have recovered liberty and strength, and should go round again among my fellow-men, boating, riding, bathing, toiling hard with a wood-knife in the forest."

Throughout his residence in Samoa he had only two or three short periods of blood spitting. One of his biographers states: "The consumption in his lungs was definitely arrested but it seems certain that a weakening of the arteries was slowly and inevitably going on. He had influenza at least once; occasionally he was ailing, generally with some indefinite lassitude which was attributed to malaria or some other unverifiable cause." It is also reported that he had writer's cramp. The above symptoms, possibly including writer's cramp, point toward a degenerative disease of the arteries which ultimately explained his sudden and relatively easy death.

To read Robert Louis Stevenson's work with a full appreciation of the handicaps under which he toiled is to marvel at the sustained high spirit, courage and optimism issuing from his sick body; what a challenge for all who are similarly afflicted! "No excellence without great effort" may well apply to Stevenson's work. It is said that certain chapters in "The Wrecker" were rewritten eleven times. In this connection he said: "I am always cutting the flesh away." His own test of good writing was this, "If there is anywhere a thing said in two sentences that could have been as clearly and as engagingly and as forcibly said in one, then it's amateur work."

In 1887 he wrote: "I imagine nobody had ever such pains to learn a trade as I had; but I slogged at it day in and day out; and I frankly believe (thanks to my dire industry) I have done more with smaller gifts than almost any man of letters in the world." He averaged about four hundred pages each year, in addition to thousands of pages of unfinished or unpublished material. A chronological list of his published writings occupies twelve pages. His prose, exclusive of his published letters, occupies eight thousand pages in the Edinburgh Edition of his works. For him life was "a thing to be dashingly used and cheerfully hazarded."

In 1893 he wrote his friend, George Meridith:

> For fourteen years I have not had a day's real health; I have wakened sick and gone to bed weary; and I have done my work unflinchingly. I have written in bed, and written out of it, written in hemorrhages, written in sickness, written torn by coughing, written when my head swam for weakness; and for so long, it seems to me I have won my wager and recovered my glove. I am better now, have been, rightly speaking, since first I came to the Pacific; and still, few are the days when I am not in some physical distress. And the battle goes on—ill or well, is a trifle; so as it goes. I was made for a contest, and the Powers have so willed that my battlefield should be this dingy, inglorious one of the bed and the physic bottle.

The circumstances of his life and the course of his disease may seem to justify the following note which he made on a slip of paper during one of his many periods of enforced silence: "You know the remarks of no doctor mean anything in my case. My case is a sport. I may die to-night or live till sixty." According to Graham Balfour, Stevenson said while in Samoa, "I haven't had a fair chance, I've had to spend nearly all my life in expectation of death." In spite of this, the doctors received his highest tributes. The following is an introduction to remarks dedicated to his various physicians, but particularly intended for his beloved Dr. Scott of Bournemouth.

> There are men and classes of men that stand above the common herd; the soldier, the sailor, and the shepherd not unfrequently; the artist rarely, rarer still, the clergyman; the physician almost as a rule. He is the flower (such as it is) of our civilization; and when that stage of man is done with, and only remembered to be marvelled at in history, he will be thought to have shared as little as any in the defects of the period, and most notably exhibited the virtues of the race. Generosity he has, such as is possible to those who practice an art, never to those who drive a trade; discretion, tested by a hundred secrets; tact, tried in a thousand embarrassments; and what are more important Heraclean cheerfulness and courage. So it is that he brings air and cheer into the sick-room, and often enough, though not so often as he wishes, brings healing.

In November, 1894 the first volume of Stevenson's complete works came from the press in Edinburgh. This was a source of great satisfaction to the author and for this service he was lavish in his praise of his good friend Baxter.

Rejoicing in his seeming good health, the sense of work well done, the peace and comfort of home and the affection of loved ones, Stevenson came to the end of his last day December 3, 1894. The crimson burn had exceeded its bounds in the craggy heights of his brain and the fertile sources of thought were forever submerged. The following account of his death cannot be improved upon and cannot well be abbreviated:

> At sunset he came downstairs; rallied his wife about the forebodings she could not shake off; talked of a lecturing tour to America that he was eager to make, "as he was now so well," and played a game at cards with her to drive away her melancholy. He said he was hungry; begged her assistance to help him make a salad for the evening meal; and to enhance the little feast he brought up a bottle of old Burgundy from the cellar. He was helping his wife on the verandah, and gaily talking, when suddenly he put both hands to his head, and cried out, "What's that?" Then he asked quickly, "Do I look strange?" Even as he did so he fell on his knees beside her. He was helped into the great hall, between his wife and his body-servant, Sosimo, losing consciousness instantly as he lay back in the arm-chair that had once been his grandfather's. Little time was lost in bringing the doctors—Anderson, of the man-of-war, and his friend Dr. Funk. They looked at him and shook their heads; they laboured strenuously and left nothing undone; but he had passed the bounds of human skill.
>
> The dying man lay back in the chair, breathing heavily, his family about him frenzied with grief as they realized all hope was past. The dozen and more Samoans that formed part of the little clan of which he was chief sat in a wide semicircle on the floor, their reverent, troubled, sorrow-stricken faces all fixed upon their dying master. Some knelt on one knee to be instantly ready for any command that might be laid upon them. A narrow bed was brought into the center of the room; the Master was gently laid upon it, his head supported by a rest, the gift of Shelley's son. Slower and slower grew his respiration, wider the interval between the long, deep breaths. The Rev. Mr. Clarks was now come, an old valued friend; he knelt and prayed as the life ebbed away.

The natives came from every quarter to pay their respects and to express their genuine grief. After a council among their chiefs, forty natives undertook the task of clearing a road up the steep mountain side to the summit; Stevenson's own chosen spot. On this memorable afternoon, December the fourth, according to his expressed wish, his body was laid to rest on this commanding eminence flanked by primeval forests with shining vistas toward his beloved sapphire sea. By order of Samoan chiefs the use of firearms was forever silenced on the hillside so that the song of birds might perennially blend with the music of his requiem and the far-away murmur of the Pacific. On the Samoan tomb are two bronze plates, upon the one is Stevenson's own Epitaph:

1850 ROBERT LOUIS STEVENSON 1894

Under the wide and starry sky,
Dig the grave and let me lie.
Glad did I live and gladly die,
And I laid me down with a will.

This be the verse you grave for me;
Here he lies where he longed to be;
Home is the sailor, home from sea,
And the hunter home from the hill.

The other bronze tablet contains the following in Samoan: "The Tomb of Tusitala" (The Writer of Tales) followed by the story of Ruth and Naomi taken from the Samoan Bible.

We revere the soul so tried by the fire of Celtic emotions, so driven by the urge of an impetuous genius, yet kept in its appointed course by an abiding sense of equity. "It is to keep a man awake, to keep him alive to his own soul and its fixed design of righteousness, that the better part of moral and religious education is directed; not only that of words and doctors, but the sharp ferule of calamity under which we are God's scholars till we die."

[From Michaelis Ettmulleri: Philos. et Medic. Doctoris.]

BOOK REVIEWS

A SHORT HISTORY OF SOME COMMON DISEASES. By divers authors. Ed. by W. R. Bett, M.R.C.S. Eng., L.R.C.P. Lond. London, Oxford Univ. Press, Humphrey Milford, 1934.

A list of the sixteen subjects dealt with in this book with the names of the Authors will suffice to indicate the high value which may be attached to its contents: Acute Infectious Diseases, by Sir John F. H. Broadbent, Bart.; Tuberculosis, by Prof. John Fraser; Venereal Diseases, by Sir D'Arcy Power; Pneumonia, by E. M. Brockbank; Rheumatism, by F. John Poynton; Rickets, by Leonard Findlay; Endocrine Disorders, by Sir Humphry Rolleston, Bart.; Bright's Disease, by Prof. J. A. Nixon; Heart Disease, by Robert O. Moon; Epilepsy, by James Collier; Arthritis, by John D. Comrie; Gall-stones, by Prof. D. P. D. Wilkie; Tonsils and Adenoids, by Lionel Colledge; Appendicitis, by W. R. Bett; Malignant Disease, by Harold Burrows; Malingering, by Sir John Collie.

Written by men who are not only recognized masters of the practical knowledge of their subjects but also students of the historical aspects of those subjects every article in this delightful book well repays perusal. The Editor is to be congratulated not only on his distinguished list of authors but also on his choice of subjects, sufficiently important and various to interest many readers. It is evidently owing to good editorial planning that the articles dealing with such diverse topics nevertheless show a uniformity in scope, each covering the salient points in the history of the disease with which it deals down to the most recent times.

MEDICINE IN PERSIA. By Cyril Elgood, M.D., M.R.C.P. Late Physician to the British Legation, Teheran, Persia. With 11 illustrations. Clio Medica. N. Y., Paul B. Hoeber, Inc. 1934.

The Author divides the medical history of Persia into two periods, the pre-Muslim and the Muslim, the latter beginning in the year 642, when Mahomedans overthrew the Persian army in the battle of Nihiwand. With that victory Arabic influences predominated Persian medicine as they did European medicine some years later. Our knowledge of ancient Persian medical history is chiefly based on the "Shah Nameh," or "Epic of the Kings," a sort of traditionary and legendary history of Persia in the form of an epic poem, which was completed by the poet Firdausi in 1099 A.D. Most students of medical history are familiar with the story of the Greek physician Democedes as given by Herodotus. Democedes cured King Darius of a dislocated ankle, and his wife Atossa of an abscess of the breast. Before this Darius had surrounded himself with Egyptian physicians whom he considered the best in the world. Thus we see Egyptian medicine influencing Persian medicine as it undoubtedly did that of Greece. In spite of the absence or scantiness of historical data Dr. Elgood thinks that the Greeks were indebted to the Persians for two very important theories in their medical teaching. He believes that the humoral doctrine originated in India prior to 2,000 B.C., spread thence to Persia and ultimately was transmitted by the Persians to the Greeks, and he also thinks that it is to the Persians that the Greeks are indebted for the theory of the relation of the microcosm, man, to the macracosm, the universe, as this theory is elaborated in some of the Zoroastrian writings of unknown antiquity. Unfortunately for a period of nearly six hundred years, from the death of Alexander in 323 B.C., to the accession of King Ardeshir in 226 A.D., there are absolutely no authentic historic records of Persian history, though Dr. Elgood believes from the term Magi which was applied to them, which is the Persian term for a Zoroastrian priest, that the three wise men who are said to have been present at the birth of Jesus Christ were Persian sages, and he ascribes the stories of demoniac possession and of diseases due to evil spirits which are found in the New Testament to Persian influence on the Jews, pointing out that dualism was a prevalent belief in Persia, whereas it is not found except in rare instances in the previous Hebrew writings.

The Author gives a most interesting account of the University of Jundi Shapur, more familiar to English readers as Gondisapor, and of the great Persian medical writers during the Arabic period. It is hardly necessary to recall the names of the great physicians from Hunain, or Johannitus, to Avicenna who shed such glory on Arabic medicine over some hundreds of years. They not only wrote books which exerted great influence but they also taught medicine to innumerable students at the bedside in the great hospitals with which Baghdad and the other great Islamic cities were provided by the liberality of the various caliphs. After the Mongols overran Persia there is little of interest to record in its medical history.

This little volume, uniform with others in the "Clio Medica" series, contains some very curious anatomical illustrations of the nature of the "five picture series" from a Persian manuscript in the Library of the College of Physicians of Philadelphia. As so little is written or known about Persian medical history this book is of great value.

BENJAMIN RUSH: PHYSICIAN AND CITIZEN, 1746–1813. By Nathan G. Goodman. Phila., Univ. Pennsylvania Press, 1934.

It is certainly curious that this should be the first biography of one, who was not only as Dr. S. Weir Mitchell said "the greatest physician this country has produced," but also a Signer of the Declaration of Independence, an active participant in the cause of Independence, founder of Dickinson College, and prominent as a leader in many other public activities, such as abolition, penal reform and the temperance movement. Besides the customary eulogies which were published shortly after his death, there have been many contributions to periodic literature down to the present day dealing with various phases of his strenuous, useful life. A book has been published on his services to education; numerous articles have dealt with his services to psychiatry as the pioneer alienist of America; much has been written about his medical services during the Revolution; his writings about yellow fever in Philadelphia are constantly referred to in works dealing with that disease, and his fame as a teacher in the earliest American medical school is mentioned in every medical history. This is, however, the first complete biographical study of one who is certainly worthy of such a labor, and there was ample original source material upon which the Author could draw and of which he has made full and skilful use. Dr. James Rush, son of Dr. Benjamin Rush, left a large sum of money to found the Ridgeway Library, which is operated as a branch of the Library Company of Philadelphia. In it are preserved an enormous amount of original manuscript letters, notebooks and memoranda in Dr. Benjamin Rush's handwriting. This vast mass of material has heretofore been scantily used. With it, and original material scattered in other libraries, Dr. Goodman has had a marvelous mine from which to extract his information and he has shown great judgment and skill in its use.

The house still stands in which Benjamin Rush was born in 1745, on a farm at Byberry near Philadelphia, on which his first American ancestor John Rush, who had been a cavalry captain in Cromwell's army, had settled in 1683. He received his schooling at the academy at Nottingham, which was then presided over by the Reverend Samuel Finley, who later became president of the College of New Jersey (Princeton). Dr. Finley's wife was a sister of Rush's mother, and it is he who is said to have determined Rush to study medicine, instead of law as he had originally purposed. On leaving school Rush entered the College of New Jersey, from which he graduated in 1760, and then began his medical studies under Dr. John Redman in Philadelphia. He attended the courses on anatomy and obstetrics given by Dr. Shippen. In 1766 he went abroad to study at the University of Edinburgh, from which he received his M.D. in 1768. He then went to London to attend the lectures of William Hunter. While in London Rush was kindly looked after by Benjamin Franklin and by Fothergill and Lettsom, the two London physicians who so constantly befriended young Americans when pursuing their medical studies in that metropolis, and met socially Sir Joshua Reynolds, Samuel Johnson, Oliver Goldsmith and other literary and artistic celebrities. Returning to Philadelphia in 1769, Rush received the appointment of Professor of Chemistry in the medical school of the College of Philadelphia which had been founded in 1765. From the beginning of the troubles with the Mother Country Rush had embraced the cause of the Colonies with enthusiastic ardor. From the first he was an advocate of complete independence. He has the distinction of being the only man possessing a medical degree who signed the Declaration of Independence. Throughout the Revolution he was active with pen and speech in the patriotic cause, and he also served in the medical department of the Continental Army, for some time being surgeon-general of the Middle Department. In this capacity he came in conflict with his colleague in the medical school, Dr. William Shippen, Jr., Director-General. Rush accused Shippen of negligence of duty, with trading in army stores, and other grave faults. Shippen was tried and acquitted by a court martial and Rush resigned his commission. More serious in its consequences to Rush's future fame was his denunciation of Washington. The Author has done much to elucidate this unfortunate episode. He claims that Rush was not really a member of the "Conway Cabal," which was a conspiracy on the part of Conway and Gates to displace Washington and get the high positions in the army for themselves. Rush wrote letters, particularly to John Adams, disparaging Washington in the most bitter terms. In a letter to another friend he writes, "A great and good God hath decreed America to be free, or the General and weak counsellors would have ruined her long ago." Finally in an anonymous letter he wrote Patrick Henry he used such language that Henry forwarded the letter to Washington, the authorship being revealed. In this letter Rush urged that Washington should be replaced by Gates, Conway, or the despicable traitor Arthur Lee. Rush may not have been a member of the Cabal but he was on terms of friendship with its members and he advocated their wishes. Later he bitterly regretted his foolishness and sought and obtained a reconciliation with Washington. Goodman says his greatest crime was indiscretion; he "allowed impulse to overrule prudence and self-possession."

As a teacher Rush probably influenced American medicine more than any man has ever done in this country. In this capacity in the course of forty years he taught over 3000 pupils, who subsequently transmitted his methods and ideas over the whole United States. He not only had the largest practice of his day in Philadelphia but he was also physician to the Pennsylvania Hospital for thirty years. His natural ability, educational advantages and vast experience rendered him fitted above all others to fill the position of a teacher.

Goodman gives an excellent account of Rush's splendid services during the yellow fever epidemics which afflicted Philadelphia in 1793 and for some subsequent years. His "Account of the Yellow Fever" in Philadelphia in 1793 is a classic, and though his treatment of the disease by doses of 10 grains of jalap combined with 10 grains of calomel, and accompanied by frequent copious venesections, was disapproved of by many of his colleagues and seems too strenuous to us, nevertheless, he seems to have been more successful in the management of his cases than any other physicians of the city. Rush has been justly compared to Sydenham. He was on the track of focal infections long before that source of disease was thought of, reporting cases of rheumatism, epilepsy and dyspepsia, cured by the removal of infected teeth. He was the first American psychiatrist, treating insanity as a disease and seeking to ameliorate the condition of the insane. His "Inquiries and Observations upon the Diseases of the Mind" is still worthy of perusal. Rush was what would now be known as a pacifist. He opposed military parades or any other demonstrations calculated to inspire a martial spirit. He was an ardent opponent of tobacco, terming it a "vile weed," and equally strong in his advocacy of temperance in regard to alcohol. Strongly interested in penal reform, he opposed capital punishment and public whippings or other open degradation of criminals. He took a deep interest in educational problems, and was the chief factor in founding Dickinson College at Carlisle, Pennsylvania. At his death in 1813 there was an outpouring of sorrow from all over the country. His mistakes had arisen from his strong individuality which had led him to be at times dogmatic and intolerant, and his impulsiveness and pugnacity carried him further then the dictates of prudence on many occasions.

The book concludes with a most comprehensive bibliography and an excellent index. It is well illustrated and artistically got up. The Author is to be congratulated on having written a work which presents an adequate portrait of a great physician, who was also a distinguished figure in the history of the Revolution, and one whose life touched public and social affairs at so many and various points that it can not fail to excite the interest of any intelligent reader.

POSTURES AND PRACTICES DURING LABOR AMONG PRIMITIVE PEOPLES, ADAPTATIONS TO MODERN OBSTETRICS, WITH CHAPTERS ON TABOOS AND SUPERSTITIONS AND POST-PARTUM GYMNASTICS. By Julius Jarcho, M.D., F.A.C.S. With 130 illus. N. Y., Paul B. Hoeber, Inc., 1934.

There are probably more superstitions and taboos dealing with various phases of the sexual life than with any other function or activity of the human body and their influence on the development and destinies of many peoples over the face of the globe can hardly be overestimated. The Author of this volume has had a very large obstetric experience among many classes of people, as a result of which his attention was long since directed to a study of the various practices which prevailed among different races and in different regions and he has devoted many years to the study of what we might term comparative obstetrics, and as many obstetric procedures have arisen from or are associated with taboos and superstitions he has embraced such of these as bear upon the obstetric art in his study. The result is a most interesting, curious and important contribution to obstetric literature. Although there has been much written upon the subject this is so far as we are aware the most systematic compilation of the kind, and the practical value of the work is manifested in the Author's aim to show that many of the most supposedly modern obstetric procedures have been anticipated by uncivilized, or only partially civilized peoples in their efforts to alleviate or render safer the birth of their offspring. In recent years the parturition of various monkeys and apes has been studied and Dr. Jarcho devotes a chapter to a summary of the study of a number of such cases. As a result of his observations C. C. Hartman states the monkeys assumed a squatting or half-sitting position during delivery, and as this is the position also assumed by a large portion of the human race particularly in Africa and China he hazards the suggestion that it is the natural one and that perhaps modern obstetrics has gone too far in eliminating it.

As an instance of the practical application of the Author's researches we may survey his discussion of this subject of posture in labor. Primitive women assume the sitting, kneeling or squatting position during labor, following their intuitions. Jarcho quotes from the Old Testament a reference to the patient being seated on the knees of another person and finds that this custom prevails yet among such varied peoples as the Andaman Islanders and the rural population in parts of Pennsylvania, Missouri and Georgia. This position in delivery led to the development of the obstetric chair. This appliance was used by the ancient Egyptians and is mentioned with favor by Paulus Aegineta, Oribasius and Avicenna. Dr. Jarcho in his own practice places almost all his patients in a rocking chair and keeps them in it till labor is well advanced. These practices are in strong contrast to the traditional British custom prevalent in Great Britain and America of placing the patient on her left side with her back to the accoucheur. Space does not permit a longer review of this interesting and important work. The numerous and excellent illustrations which accompany the text are of great value as they show better than words can express the various positions and anatomical points with which the Author deals.

JÖNS JACOB BERZELIUS. Autobiographical Notes. Published by the Royal Swedish Academy of Sciences through H. G. Söderbaum. Trans. from the Swedish by Olaf Larsen, Prof. of Anatomy, Univ. of Oregon Medical School. Balt., Williams & Wilkins Co., 1934.

This is the sixth work published under the auspices of the History of Science Society with the assistance of funds contributed by the Carnegie Corporation of New York and its importance as a contribution to the history of the development of the science of chemistry at one of its most important epochs fully justifies its selection for such publication. The rules of the Royal Academy of Sciences of Sweden prescribe that each member should present to the Society an autobiographical sketch of his life at the time of his election and that he should contribute additions thereto at the expiration of each subsequent decade. The autobiography of Berzelius covers his life from his birth in 1779 to the year 1840. He died in 1848. It is to be regretted that this most interesting volume does not include an account of his last eight years. Berzelius relates with a charming candidness and simplicity his early struggles with poverty and the difficulties with which he had to contend in completing his medical studies and carrying out his early chemical researches. In spite of heavy financial losses in later years because of lack of business ability he achieved not only fame but an ample competence and his last years were passed in comfort and tranquillity. His most interesting records deal with his sojourns in England and France where he met and was honored by the leading scientists of his time. In spite of an unfortunate misunderstanding with Sir Humphry Davy due to Sir Thomas Young's indiscretion in showing Davy some criticisms of his (Davy's) "Elements of Chemistry," which Berzelius had written in his copy of that work, they saw much of one another and though subsequently other misunderstandings occurred they seem to have held one another in high esteem. In France he enjoyed the society of a brilliant group of scientists, including La Place, Haüy, Gay-Lussac, Biot, Cuvier and Berthollet. In Germany he met Goethe to whom he had the pleasure of demonstrating the usefulness of the blowpipe in the study of mineralogy. He describes his own discoveries and contributions to chemical science with charming naivete.

Dr. Larsell has done a great service to the history of medicine in giving to English readers an opportunity to read a book previously practically inaccessible to them. He has provided some most valuable notes to the text. We regret the absence of an index to complete so excellent a book.

The Sinister Shepherd: A Translation of Girolamo Fracastoro's Syphilidis sive de Morbo Gallico Libri Tres. By William van Wyck. Los Angeles, Primavera Press, 1934.

To most English readers Fracastoro's famous poem is only known through the translation by Nahum Taté, a very free rendering of the original, and the time is ripe for the appearance of a new translation by a competent scholar of this early account of a disease whose origin has baffled scientists to the present date as much as it baffled the contemporary scientists who wrote the earliest descriptions of it. The book is prefaced by a brief sketch of the life of Fracastoro by Dr. Albert Garrigues, which was published in *Aesculape* in 1925. Girolamo Fracastoro was born in 1483 and died of apoplexy in 1553. Like many of the great European physicians of his day he not only practiced medicine but taught philosophy, occupying the chair on that subject at Padua at the early age of nineteen. He wrote much but his most famous work and the one which has done most to preserve his name to posterity is the poem "Syphilidis sive de Morbo Gallico libri tres," published in 1530. It is the only poem so far as we know to which a pathological entity owes its name. Although Fracastoro states that the epidemic of the disease came because of the conjunction of Jupiter, Saturn and Mars in the sign of Cancer, he was also a believer in its American origin. His poem tells how Columbus and his crew witnessed a religious ceremony performed by the natives of the island of San Domingo. The savage chief explained its nature as follows. The people in ancient times had had a king named Alcithous, whose flocks and herds were tended by a shepherd named Syphilus. One summer the latter rebelled at the terrible drought created by the heat of the Sun, and denounced the latter, declaring that henceforth he would not worship him, but would render worship to King Alcithous, who was much more worthy of being regarded as a god. In furious wrath the Sun retaliated:

The sun went pallid for his righteous wrath
And germinated poisons on our path.
And he who wrought this outrage was the first
To feel his body ache, when sore accursed.
And for his ulcers and their torturing,
No longer would a tossing, hard couch bring
Him sleep. With joints apart and flesh erased,
Thus was the shepherd flailed and thus debased.
And after him this malady we call
Syphilis, tearing at our city's wall
To bring with it such ruin and such a wrack,
That e'en the king escaped not its attack.

The ceremony which the Spaniards witnessed was an expiatory sacrifice in commemoration of the event. Fracastoro goes into the therapeutic measures to be employed against syphilis at great length. Mercury and guiac were the two specifics, but there were many drugs, chiefly simples which were useful adjuvants. The poem should be read not only because of its fame but because of the very excellent summary it gives of the therapeutic measures employed by a first class physician in the sixteenth century. In an appendix is given Ulrich von Hutten's account of the origin of the French Disease taken from his famous treatise. A number of interesting illustrations accompany the text. We can only hope that all students of medical history will read this most delightful translation of a famous work which though known to all has been read by few.

BIOGRAPHISCHES LEXICON DER HERVORRAGENDEN ÄRTZE ALLER ZEITEN UND VÖLKER. Zweite auflage durchgesehen und ergänzt von Prof. W. Haberling und Prof. H. Vierodt, unter Mitarbeit von Prof. H. Hübotter. Fünfster Band. Sambucus—Zyphen. 64 Illus. Berlin, Urban und Schwarzenberg, 1934.

This is the fifth and concluding volume of this very important biographic dictionary covering physicians of all times and all countries, and it shows in some respects a marked improvement over the preceding volumes. This is very noticeable in the biographic sketches of American physicians. The selection of these is good and the biographies well written. The editors have evidently very wisely followed the lead of Kelly and Burrage in choosing really worthwhile subjects and not, as in former volumes, relied so much on the older compilations of Atkinson and Watson. The bibliographies given with the sketches are quite complete and adequate. It is somewhat curious that the only American name on the list of contributors should be that of the late John S. Billings, of Washington, who died in 1913. This is probably because the work is based on the Lexikons of Hirsh and Pagel to which he did contribute. This volume like its predecessors is attractive in format, with good paper and type, and some excellent portraits. All writers on medical history will find this Lexikon an invaluable work of reference.

ERRATUM

In the Review of Bader's "Entwicklung der Augenheilkunde im 18. und 19. Jahrhundert mit besonderer Berücksichtigung der Schweiz," by Dr. Burton Chance, which appeared in the March, 1934 issue of the ANNALS, on page 192, column 1, line 25, *exophthalmus* should read *enophthalmus*.

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Cum INDICE locupletiſsimo.

[From Franciscus Vallesius: Hippocrates. Coloniae, 1589.]

ANNALS OF MEDICAL HISTORY

Editor: FRANCIS R. PACKARD, M.D., Philadelphia

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